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# Vol. I

## TRANSCRIPT OF RECORD

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Supreme Court of the United States

OCTOBER TERM, 1939

No. 681

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RAILROAD COMMISSION OF TEXAS ET AL.,  
PETITIONERS,

vs.

ROWAN & NICHOLS OIL COMPANY

---

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT  
OF APPEALS FOR THE FIFTH CIRCUIT

---

PETITION FOR CERTIORARI FILED JANUARY 29, 1940.

CERTIORARI GRANTED MARCH 11, 1940.



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CAPTION.

BE IT REMEMBERED, That at a regular term of the United States District Court in and for the Western District of Texas, the Honorable Robert J. McMillan, United States District Judge, presiding, and holding its sessions at Austin, Texas, which said term began on the 12th day of June, A. D. 1939, and continued in session to and included the 14th day of June, A. D. 1939, there came on to be heard and determined, among other causes pending on the docket, the following cause:

No. 624 In Equity.

ROWAN & NICHOLS OIL COMPANY,

versus

RAILROAD COMMISSION OF TEXAS, ET AL.

---

COMPLAINANT'S ORIGINAL BILL OF COMPLAINT.

2

(Title Omitted.)

To said Honorable Court:

Comes now Rowan & Nichols Oil Company, hereinafter styled Complainant, and complaining of the Railroad Commission of Texas, C. V. Terrell, Lon A. Smith, Ernest O. Thompson, and William McCraw, in their official capacities; hereinafter styled Respondents, files this its original Bill of Complaint, and for cause of action, respectfully shows unto the Court the following:

I.

Complainant is a private corporation, duly organized and existing under and by virtue of the laws of the

State of Texas, with principal domicile in Fort Worth, Tarrant County, Texas, Respondent, Railroad Commission of Texas, is a duly created and existing agency of the State of Texas charged with the administration of the conservation laws of the State of Texas, affecting oil and gas production, and Respondents, C. V. Terrell, Lon A. Smith, and Ernest O. Thompson, are the duly elected, qualified and acting members of said Commission, with official residences in Travis County, Texas, and Respondent William McCraw is the duly elected, qualified and acting attorney general of the State of Texas with official residence in Travis County, Texas. Service may be had on the Railroad Commission in this case by delivery of process to C. F. Petet, who resides in Travis County, Texas.

## II.

The jurisdiction of the subject-matter and parties in this cause is vested in this Court upon the following grounds:

(a) This suit is of a civil nature and arises under the constitution and laws of the United States of America, as hereinafter more fully set out, and the orders complained of are especially repugnant to the due process and equal protection clauses of the Fourteenth Amendment to the Constitution of the United States.

(b) The value of the property and the amount involved is in excess of \$3,000.00, exclusive of interest.

## III.

Complainant is the owner of an oil, gas and mineral leasehold estate in a certain 24.99 acre tract situated and located in the W. H. Castleberry League in Gregg County, Texas, B. C. Todd, et al, fee owners, more particularly described in the lease attached hereto, marked Exhibit



"A", and made a part hereof, said oil and gas lease being recorded in the Oil and Gas Lease Records of Gregg County, Volume 98, Page 562, et seq., to which reference is here made. Thereunder, Complainant owns seven-eighths of the oil, gas and other minerals in place under said land and the right to enter thereon and by mining operations reduce said minerals to physical possession, and has five wells drilled in accordance with the existing rules, regulations, and orders of the Railroad Commission and producing oil from said land. Complainant is producing from said lease, in accordance with the order of the Railroad Commission of Texas, dated August 29, 1938, the following number of barrels per day: Well No. 1, 22.388; Well No. 2, 22.272; Well No. 3, 22.388; Well No. 4, 22.504; Well No. 5, 22.272.

#### IV.

Complainant's lease and the wells producing thereon are located in what is known as the East Texas oil field. Said field is water-driven and embraces a territory of about forty miles in length and four miles in width. The west side of the field is underlain with what is known as "bottom water"; no water underlies the east half, and the water is slowly but perceptibly rising in the western portion thereof, one well to ten acres can reasonably drain such area in the East Texas field during the flowing life thereof, if produced under proper restrictions and in accordance with good petroleum practice; said field is substantially a flowing field. There are approximately 133,000 acres underlain by oil in said field, and the average sand thickness of the oil bearing sand is 42 feet, whereas the sand thickness under Complainant's lease is 100 feet; there are approximately 5,586,000 acre feet of oil sand in the entire field and 2,499 acre feet of oil sand under Complainant's lease;



the production of oil from said field as of August 31, 1938, was 1,238,080,665 barrels, and from Complainant's lease as of August 31, 1938, 345,165.59 barrels; the average controlled potential of a well in East Texas is 605 barrels, and the average controlled potential of each well on Complainant's lease is 964 barrels. As of August 30, 1938, there were approximately 25,500 wells producing and authorized to be drilled in said field, of which number, over sixty per cent were allowed as exceptions to Rule 37, of the rules and regulations of the Railroad Commission, copy of which is attached hereto and marked Exhibit "B"; the uncontrolled potential of wells in said field varies from less than 20 barrels per well to 30,000 barrels per well per day. Complainant's wells are situated in what is known as the "Gladewater Nose",

5

which is most favorably situated on the structure and producing horizon of the East Texas field, equidistant between the eastern and western limits thereof. The oil saturated sands thereunder are of maximum thickness, and there is no danger of encroachment of water, at the present time and for a long time to come, with the result that said wells can be continually produced for many months without an excessive oil and gas ratio and with no physical waste, and without the danger of creating an element set forth in the statutes which would authorize Respondents to artificially restrict production from Complainant's wells except under reasonable exercise of the State's police power. The oil production sands to the East of Complainant's property are of continually decreasing thickness, pinching out to nothing on the eastern edge. None of the wells lying between Complainant's property and the Eastern edge are capable of producing nearly as much oil as Complainant's wells, and none of the wells lying between Complainant's property and the western edge of the field are capable of producing for as long a time as Complainant's wells, unless by artificial methods of restriction,

such as the Commission is now requiring, Complainant's production is cut down. If the field is produced in an orderly manner, and as near ratably as may be, each person withdrawing oil underlying his land, and which can be brought to his well by proper production methods, will produce from his well in accordance with the advantage of its situation.

The total recoverable oil under Complainant's lease, based upon the porosity, permeability, oil saturation, and thickness of the sand underlying the lease, is approximately 57,000 barrels per acre, and the total recoverable oil in the common pool existing in the East Texas field is approximately 2,000,000,000 barrels.

## V.

Under the laws of the State of Texas as construed by the decisions of the highest Court in the State of Texas an operator of an oil and gas lease is the owner  
 6 in severalty of the oil and gas in place beneath the land under the lease to him and has a property right entitling him to an opportunity equal to that of adjoining operators in the production of oil from the common reservoir. Likewise he has no cause of action for damages by reason of the recovery through drainage by his neighbor of the oil originally underlying his tract, and by reason of the provisions of Rule 37 is not entitled to the same degree of self help for the protection from drainage as was accorded to him under the common law rule of capture.

There has been ascertained and can be ascertained in the East Texas field accurate information as to the sand thickness, properties of the reservoir sands, and their fluid contents; so as to estimate the quantities of oil and gas present as of any particular date, in almost any portion of the reservoir. The computation can be made and

has been made with a degree of accuracy which is sufficiently precise to establish a basis for equitable allocation of production to the owners of oil and gas in place, so as to accord unto each one an equal opportunity to recover his fair share of the oil, as has been done in other fields where sand conditions are not as uniform as those in East Texas.

## VI.

Complainant is now being compelled to artificially restrict its production from its wells by order of the Railroad Commission dated August 29, 1938, copy of which is attached hereto and marked Exhibit "C". By reason of said order each well is permitted to produce daily a maximum of only 2.32% of its hourly potential capacity as determined by the Commission, except certain wells are permitted to produce not less than 20 barrels per day, regardless of their potential capacity. If Complainant produces in excess of said allowable, it will be subjected to penalties in the form of fines and severe forfeitures and is penalized by being unable to transport such excess oil in intrastate, interstate, or foreign commerce.

## VII.

Complainant could effectively drain its fair share of the oil through the wells located on its lease at the present time, if its daily allowable bore the same relation to the total daily allowable as the recoverable oil thereunder bears to the total recoverable oil in the field. But Respondents do not adjust the allowable between wells on any basis other than the controlled potential of said wells, as determined by the Commission which is fiction and not fact, with the result that an operator, including Complainant, is placed in the position of either surrendering its property through drainage, or being com-

pelled to drill additional and unnecessary wells, if permit therefor is granted by the Commission, to offset the drainage caused by the granting of other wells on small tracts as more particularly hereinafter set out. Respondent Commissioners have publicly announced that they do not take into consideration the confiscatory cost of drilling offsets and regard an operator's only remedy as that of offset, whatever the cost may be, to prevent drainage of his property under the allocation of allowable, and do not consider that proration or ratable production bears any relation to or has any connection with the drilling of wells. Said plan of proration entirely disregards differences as to each well in its productive capacity, situation on the structure, thickness and character as to the richness and yield of the underlying sands, and the density to which leases have been drilled, and proximity of water. By reason of said order and its artificial restriction methods, Complainant's allowable does not bear the same proportion to the total daily allowable as the recoverable oil under its lease bears to the total recoverable oil in said East Texas field.

8 If Complainant's allowable was based on the formula just stated it would approximate 235 barrels per day, but instead, approximates only 112 barrels per day.

### VIII.

The plan of proration now maintained does not take into consideration acreage of leases or density of drilling on leases, with the result that an operator having one well on one acre may recover daily and ultimately ten times as many barrels of oil per acre as the operator of an adjoining lease which is drilled to a density of only one well to ten acres, although the amount of recoverable oil per acre under each lease is the same, and thereby the operators of the more densely drilled tract

is given an advantage over the operators of the adjoining less densely drilled tract in the production of oil in violation of the declared property right, and such operator of the more densely drilled area is allowed to drain and take oil belonging to the operators of the adjoining tract. For example, the Respondent Commission has granted a permit to R. M. Wood on a strip immediately to the south of Complainant's lease, comprising approximately one-tenth of an acre and he is being permitted to produce, and has produced from said one well since its completion on August 22, 1937, 22,272 barrels per day from said one well which is as much as Complainant is permitted to produce from any of its five wells, although Complainant's lease comprises 25 acres, or one well to each five acres, and the amount of recoverable oil per acre under said two tracts is approximately the same, and thereby said R. M. Wood is permitted, by the order of the Commission, to take Complainant's oil.

There are contained in the East Texas field many hundreds of tracts of less than five acres, and of less than ten acres, on which the Commission has authorized the drilling of an average of one well to one acre.

9 From many of these tracts, the production has been far in excess of the amount of oil which underlay same and by reason of the plan of proration herein complained of said tracts, and particularly those to the east of Complainant's lease, have as much oil under same as had originally been there. The rate of the withdrawal from each well on said tracts has been substantially equal to that of Complainant's wells. Said numerous tracts, by reason of the present plan of proration, have been draining the recoverable oil and dissipating the producing energy from Complainant's land, and their reserves have risen and will continue to rise while Complainant's will decrease and continue to de-



crease. If the present proration plan is maintained, Complainant will lose oil to which it is entitled to the wells on the east side of the field, long prior to the exhaustion of the oil and gas in the reservoir, the water will saturate Complainant's wells, drowning them out, and sands lying to the east will produce the oil which will have been driven from Complainant's lease to theirs, as a result of all of which said order is discriminatory, confiscatory, oppressive, and grossly inequitable.

### IX.

Complainant is entitled to the fullest use and enjoyment of its property and to the recovery of the minerals thereunder, co-extensive with the use and enjoyment of other properties situated in said field, and so long as Complainant's use and enjoyment does not interfere with the use and enjoyment by others of their properties in said field and does not conflict with the public welfare, Complainant is entitled to exercise its rights of ownership and the reasonable use of its property, if it can ratably recover the minerals to which it is legally and constitutionally entitled according to the favorable position and amount of its acreage, the sand thickness, bottom hole pressure, and other proper determinative factors of ultimate recovery therefrom without committing physical waste and without unreasonably interfering with others in the enjoyment of their properties located in said field and consistent with the reasonable requirements of public welfare.

### X.

The straight potential basis of allocation is inequitable, arbitrary, and unreasonable because it can be equitable only if well spacing is uniform, and if well potentials are proportional to recoverable oil in place in the drainage area of each well, and if potentials are taken on each

individual well in the field instead of ~~on~~ only a few "key" wells and fictitious potential contour lines drawn governing the potential ability of the other wells to produce. Notwithstanding the potential of the wells, located on Complainant's lease is practically the highest in the field and notwithstanding its favored position on the structure, the disparity between the daily allowable of Complainant's wells and that of the poorest wells in the field is less than four barrels. The effect of the present plan of proration is to apportion the allowable on a practically per well basis, because no matter how many wells an operator has drilled upon his lease, he is permitted to produce 2.32% of the hourly potential of each of said wells as determined by the Commission. Said order therefore bears no reasonable relation to the prevention of physical waste, but transcends public necessity and assumes the character of a mere arbitrary fiat. Until and unless said daily allowable of 235 barrels per day, is allocated to Complainant's lease and the production thereon permitted by the Respondent Commission, Complainant will not have and is being deprived of an equal opportunity with other owners in the East Texas field to recover that portion of the oil to which it is entitled, and consequently the enforcement of said proration order by the Commission against Complainant is to deprive Complainant of property without due  
 11 process of law, and it not receiving the equal protection of the law as guaranteed to it by the Constitution of the State of Texas and the United States.

## XI.

Complainant can produce what it contends is its fair share of the oil and daily allowable without causing waste and alleges that its request is proper, reasonable, and fair, and one to which it is entitled to under the Constitution and laws of this State and the United States.

Complainant can produce from its wells the amount of oil to which it is equitably entitled without dissipation of the gas energy or water drive, injury to the sands, or other formation, with reasonable gas-oil ratio, without any underground or other waste, without unlawful injury to the property of adjoining lessees, and without violating any of the statutes or orders of the Commission, with reference to waste, other than those complained of herein, and all of which oil so produced will not be in excess of the market demand.

## XII.

On or about February 24, 1938, Complainant filed with the Railroad Commission of Texas an application requesting an adjustment of allowable so that it would have an equal opportunity to recover its fair share of oil, and, in the alternative, if it was shown not to be entitled by law to such relief, that it be granted permits to drill twenty more wells, so as to give it a density commensurate with that of its neighbor, although it insisted and insists now that it did not need more wells, but more allowable. A hearing on said application was held on March 11, and on March 17, the Commission entered its order denying all of said application, except to grant Complainant one well as a direct equidistant offset to the well theretofore granted by said Commission to said R. M. Wood. Said order is attached hereto and marked Exhibit "D". By motion for rehearing,

12 copy of which is attached hereto and marked

Exhibit "E", Complainant asked that the Commission's order denying its relief, be set aside and held for naught, for the reasons stated therein, and alleging again it did not need more wells, but more oil. On March 31, by order of said date, copy of which is attached hereto and marked Exhibit "F", said motion for rehearing was granted, and said rehearing was held before



certain employees of the Railroad Commission on May 4, 1938. In addition thereto, Complainant appeared before the Commission at its Statewide hearings on March 17, 1938, and May 17, 1938, and presented and renewed its application for an adjustment of allowable, and, in the alternative, for additional wells, and directed the Commission's attention to the fact that its plan of allocation was unfair, inequitable, and contrary to Complainant's constitutional rights, but notwithstanding said representations and although the Commission has had ample time in which to pass upon the application, and although Complainant, through its counsel, has repeatedly requested relief, said Commission has wholly failed and refused to give any consideration whatsoever to Complainant's rights in the premises. At said hearing Complainant informed the Commission that if its prayer for alternative relief in any way affected its right to increase its allowable, it then and there withdrew its request for alternative relief. For a long time past and at the present time, notwithstanding the protest of Complainant, the Respondent Commission's monthly proration orders have adopted the same basis for restriction, to-wit, an hourly potential as determined by the Commission, and by ignoring Plaintiff's applications and protests, has demonstrated that it intends to maintain said basis.

### XIII.

By maintaining its present order, the respondent Commission has knowingly maintained illegal orders, which has resulted in many operators obtaining more than their fair share of the oil, for which no penalty can be imposed, and all of which has resulted in the drainage of complainant's property and has resulted in discrimination in that complainant has attempted to abide by the law and the orders of the Commission.

## XIV.

Unless said order is declared null and void, complainant fears that it will be sued by its° royalty owners for damages and for forfeiture of its lease, because the present disparity in development and allowable production will result in an allegation and contention that complainant has failed to properly develop and produce its lease, all of which is due to said order of the respondent Commission.

## XV.

The value of the amount of oil which has already been wrongfully drained from complainant's property is over \$50,000.00, and the value of the oil which is migrating from complainant's lease and which will continue to migrate by reason of the maintenance of said order, is far in excess of \$60,000.00.

## XVI.

If any of the laws of this State authorize or justify the order complained of herein, said law or laws are invalid and unconstitutional for the same reasons given for the attack upon the order herein complained of. Complainant does not complain of the law under which said order was enacted, other than as is herein specifically set forth; but, on the contrary, has always been a staunch and ardent supporter of the theory and practice of proration in the orderly production of oil, and has employed counsel and witnesses to appear before the Commission at its various hearings to insist upon the promulgation of a fair and equitable distribution of the allowable, but Respondent Commission has ignored its efforts and pleas in the premises, and Respondents have arbitrarily and with wanton disregard of the rights of Complainant, entered and promulgated orders which are arbitrary, unreasonable, and confiscatory.

## XVII.

By reason of the allegations hereinbefore set forth, Complainant has in the past and will in the future continue to suffer irreparable loss and injury, and by reason of the allegations hereinbefore set forth, is without adequate remedy at law.

Premises considered, Complainant prays:

(1) That upon a hearing, after due notice, a preliminary injunction issue out of this Court enjoining the Respondents, their successors, and their representatives, agents, servants and employees, from attempting to enforce against the Complainant in the conduct of its producing operations upon its properties in the East Texas Field hereinbefore mentioned, the orders and rules governing production in said East Texas Field, as set forth in Exhibit C, adopted by the Commission on August 29, 1938, and from enforcing against Complainant any of the terms and provisions of said rules and orders, as well as all renewal or extension orders, and as well as any and all similar monthly proration orders and schedules for the East Texas Field; and further enjoining the Railroad Commission from enforcing against the Complainant any rules and orders governing and providing for the proration of oil in the East Texas Field that deny the Complainant a right to produce that proportion of the total daily allowable that the recoverable oil under its lease bears to the total recoverable oil in the East Texas Field; and further enjoining Respondents from interfering, in any way, with the pipe line company transporting the oil so produced.

(2) That a three Judge specially constituted District Court be assembled pursuant to Section 266, Judicial Code, as amended, for the purpose of hearing and determining Complainant's motion herein for interlocutory injunction; and for the purpose of conducting the final trial herein.

(3) That upon a final hearing the preliminary injunction as prayed for herein be made permanent, and that a decree be entered herein decreeing and adjudging invalid the aforesaid orders and rules of the Railroad Commission as well as all renewal and extension orders, or rules, substantially enforcing or continuing in effect the aforesaid rules on any schedule or orders that may be promulgated by the Commission following its monthly hearing extending and enforcing in principle the above described orders and schedules as they apply to Complainant; that said orders and schedules, and each of them, as they affect Complainant, be set aside, vacated and annulled; and that the Respondents and their successors, representatives, agents, servants and employees be permanently enjoined from enforcing said orders, rules, schedules, and any renewals or extensions thereof, against the Complainant and from taking any steps whatsoever, directly or indirectly, restricting Complainant's right to produce and secure the transportation of that proportion of the total daily recoverable oil that the recoverable oil under its lease bears to the total recoverable oil in the East Texas Field.

(4) If the Court should be unwilling to grant at this time the permanent relief prayed for in the absence of positive action by the Railroad Commission specifically refusing or otherwise in terms disposing of the complaint presented by the Complainant to the Railroad Commission on March 4, 1938, as hereinbefore alleged, then in such contingency and in the alternative Complainant prays for the temporary relief as prayed for in paragraph (1) of the foregoing prayer and also for final relief in the nature of a permanent or perpetual  
 16 injunction to be in force at least until the Commission shall have set aside and vacated the rules and orders herein complained of until the Commission shall have substantially granted the relief or

removed the injuries herein complained of; and that such injunction herein prayed for shall remain in force so long as the Complainant is subjected to the confiscation of its properties and the injuries complained of herein by the enforcement against the Complainant of the aforesaid arbitrary rules and orders in the manner hereinabove set forth.

(5) For judgment against the Respondents for costs of suit and for such other and further relief as the evidence shall justify and as to the Court shall seem equitable in the premises.

DAN MOODY,  
RICE M. TILLEY,  
PHILLIP TOCKER.

Fort Worth, Texas.

State of Texas,  
County of Travis.

Before me, the undersigned authority, on this day personally appeared Phillip Tocker, who on his oath says that he is one of the attorneys for Complainant in the above styled and numbered cause; that he is acquainted with the facts set out in the foregoing petition, knows them to be true, and is authorized to make this affidavit on behalf of said Complainant, Rowan and Nichols Oil Company, and upon his oath says that the facts set out in such petition are true.

PHILLIP TOCKER.

Subscribed and sworn to before me this the 7th day of September, A. D. 1938.

CORNELIA GEORGE,

(Seal)

Notary Public in and for  
Travis County, Texas.



## OIL AND GAS LEASE

AGREEMENT Made and entered into the

29th

day of

July

1938

by and between **B.C. Todd of Longview, Texas, C.F. Todd and B. M. Todd, of Dallas, Texas, and J.W. Todd, of Oklahoma City, Okla., Mrs. Cora L. Todd, L. J. Jellin, Jr., Frank Buttram, O. M. Boren, Premier Royalty Company, Inc., and R. B. Ramey, Jr.** hereinafter called **lessor** (one or more), and **Rowan & Niebold Oil Company, a Texas corporation of Ft. Worth, Texas** hereinafter called **lessee**

WITNESSETH That the said lessor, for and in consideration of **TWENTY FIVE (\$25,000.00) THOUSAND DOLLARS**

cash in hand paid, receipt of which is hereby acknowledged, and of the covenants and agreements hereinafter contained on the part of lessee to be paid, kept and performed, has granted, demised, leased, and let and by these presents does grant, demise, lease and let unto the said lessor, for the sole and only purpose of mining and operating for oil and gas, and laying pipe lines, and building tanks, power stations and structures thereon to produce, save and take care of said products, all that certain tract of land situated in the County of **Gregg** State of Texas,

A tract of land in Gregg County, Texas, part of the Wm. H. Castleberry League and Labor Survey; BEGINNING at an old pine knot stake on the W.B.L. of said Castleberry Survey, which is the S.W. corner of the tract owned by the Todd Estate; Thence N 1 deg 05' E with the Castleberry line, 586 feet to the SW corner of a 40 acre lease of said Todd land owned by the Continental Oil Co; THENCE N 88 deg. 30' E with said Continental South line, 1867 ft. to the SE cor. of said 40 acres on the E.B.L. of said Todd tract; THENCE S 0 deg. 25' E with said line 418 ft. to an iron pipe at the S. W. cor. of the Stephens tract; THENCE S. 88 deg. 43' W 65 ft. to the corner of the Todd wire fence, a pine in said corner of fence; THENCE in a S.W. direction approximately 182 ft. to a point in road; THENCE S 88 deg. 54' W. along road and lane and continuing to point in the Castleberry league line, same being the S.W. corner of the Todd tract; a distance of 1775 feet, containing in all 25-acres of land, more or less.

and containing **twenty five**

acres, more or less.

It is agreed that this lease shall remain in force for a term of **ten** years from date, and as long thereafter as oil or gas, or either of them, is produced from said land by the lessee.

In consideration of the premises the said lessee covenants and agrees:

- 1st To deliver to the credit of lessor, free of cost, in the pipe line to which lessee may connect his wells, the equal one-eighth part of all oil produced and saved from the leased premises.
- 2nd To pay to lessor as royalty for gas from each well where gas only is found, while the same is being sold or used off of the premises, one-eighth of the market price at the wells of the amount so sold or used, the lessor to have gas free of charge from any gas well on the leased premises for all probes and inside lights in the principal dwelling house on said land by making lessor's own connections with the well at lessor's own risk and expense.
- 3rd To pay to lessor as royalty for gas produced from any oil well and used by lessee for the manufacture of gasoline, one-eighth of the market value of such gas. If such gas is sold by lessee, then lessee agrees to pay lessor, as royalty, one-eighth of the market price at the wells of the amount sold.

If no well be commenced on said land on or before the **29th** day of **July**, 1938 this lease shall terminate as to both parties, unless the lessee on or before that date shall pay or tender to the lessor or to the lessor's credit in the

**FIRST NATIONAL** Bank at **Longview, Texas,** or its successors, which shall continue as the depository regardless of changes in the ownership of said land, the sum of **twenty five** - - - - - and no/100 - - -

DOLLARS, which shall operate as a rental and cover the privilege of deferring the commencement of a well for **twelve** months from said date. In like manner and upon like payments or tenders the commencement of a well may be further deferred for like periods of the same number of months successively. And it is understood and agreed that the consideration first recited herein the down payment, covers not only the privilege granted to the date when said rental is payable as aforesaid, but also the lessee's option of extending that period as aforesaid and any and all other rights conferred.

Should the first well drilled on the above described land be a dry hole, then, and in that event, if a second well is not commenced on said land within twelve months from the expiration of the last rental period, which rental has been paid, this lease shall terminate as to both parties, unless the lessee on or before the expiration of the last rental period resume the payment of rentals in the same amount and in the same manner as hereinbefore provided. And it is agreed that upon the resumption of the payment of rentals, as above provided, that the last preceding paragraph hereof, governing the payment of rentals and the effect thereof, shall continue in force just as though there had been no interruption in the rental payments.

If at the expiration of **ten** years from the date of this lease, oil or gas is not being produced on the leased premises, but lessee is then engaged in drilling for oil or gas, then this lease shall continue in force so long as drilling operations are being continuously prosecuted on the leased premises, and drilling operations shall be considered to be continuously prosecuted if not more than sixty (60) days shall elapse between the completion or abandonment of one well and the beginning of operations for the drilling of a subsequent well. If oil or gas

shall be discovered and produced in paying quantities from any such well or wells drilled at or after the lapse of **one** year, this lease shall continue in force so long as oil or gas shall be produced from the leased premises.

It is specially agreed that in the event that oil or gas is produced from said premises and said production shall for any reason cease or terminate, lessee shall have the right at any time within ninety (90) days from the cessation of such production to resume drilling operations in the effort to make said leased premises again produce oil or gas, in which event this lease shall remain in force so long as such operations are continuously prosecuted, as defined in the preceding paragraph, and if they result in production of oil or gas, so long thereafter as oil or gas is produced in paying quantities from the premises.

If said lessor owns a less interest in the above described land than the entire and undivided fee simple estate therein, then the royalties and rentals herein provided for shall be paid the said lessor only in proportion which lessor's interest bears to the whole and undivided fee.

Lessee shall have the right to use, free of cost, gas, oil and water produced on said land for all operations thereon, except from water wells of lessor. When requested by lessor, lessee shall bury its pipe line below plow depth. No well shall be drilled nearer than 100 feet to the house or barn now on said premises without the written consent of the lessor. Lessee shall pay for damages caused by all operations to growing crops on said land. Lessee shall have the right at any time to remove all machinery and fixtures placed on said premises, including the right to draw and remove casing.

If the estate of either party hereto is assigned, and the privilege of assigning in whole or in part is expressly allowed, the covenants hereof shall extend to their heirs, executors, administrators, successors or assigns, but no change in the ownership of the land or assignment of rentals or royalties shall be binding on the lessee until after the lessee has been furnished with a written transfer or assignment or a true copy thereof; and it is hereby agreed in the event this lease shall be assigned as to a part or parts of the above described lands and the

It is agreed that this lease shall remain in force for a term of **ten** years from date, and as long thereafter as oil or gas, or either of them, is produced from said land by the lessee.

In consideration of the premises the said lessee covenants and agrees:

1st To deliver to the credit of lessor, free of cost, in the pipe line to which lessee may connect his wells, the equal one-eighth part of all oil produced and saved from the leased premises.

2nd To pay to lessor as royalty for gas from each well where gas only is found, while the same is being sold or used off of the premises, one-eighth of the market price at the wells of the amount so sold or used, the lessor to have gas free of charge from any gas well on the leased premises for all pipes and inside rights in the principal dwelling house on said land by making lessor's own connections with the well at lessor's own risk and expense.

3rd To pay to lessor as royalty for gas produced from any oil well and used by lessee for the manufacture of gasoline, one-eighth of the market value of such gas. If such gas is sold by lessee, then lessee agrees to pay lessor, as royalty, one-eighth of the market price at the wells of the amount sold.

If no well be commenced on said land on or before the **30th** day of **July**, 193 **8** this lease shall terminate as to both parties, unless the lessee on or before that date shall pay or tender to the lessor or to the lessor's credit in the **FIRST NATIONAL** Bank at **Longview, Texas** or its successors, which shall continue as the depository regardless of change in the ownership of said land, the sum of **twenty five - - - - - and no/100 - - -**

**DOLLARS** which shall operate as a rental and cover the privilege of deferring the commencement of a well for **twelve** months from said date. In like manner and upon like payments or tenders the commencement of a well may be further deferred for like periods of the same number of months successively. And it is understood and agreed that the consideration first recited herein, the down payment, covers not only the privilege granted to the date when said rental is payable as aforesaid, but also the lessee's option of extending that period as aforesaid and any and all other rights conferred.

Should the first well drilled on the above described land be a dry hole, then, and in that event, if a second well is not commenced on said land within twelve months from the expiration of the last rental period which rental has been paid, this lease shall terminate as to both parties, unless the lessee on or before the expiration of said twelve months shall resume the payment of rentals in the same amount and in the same manner as hereinbefore provided. And it is agreed that upon the resumption of the payment of rentals, as above provided, that the last preceding paragraph herofore governing the payment of rentals and the effect thereof, shall continue in force just as though there had been no interruption in the rental payments.

If, at the expiration of **ten** years from the date of this lease, oil or gas is not being produced on the leased premises, but lessee is then engaged in drilling for oil or gas, then this lease shall continue in force so long as drilling operations are being continuously prosecuted on the leased premises, and drilling operations shall be considered to be continuously prosecuted if not more than sixty (60) days shall elapse between the completion or abandonment of one well and the beginning of operations for the drilling of a subsequent well. If oil or gas

shall be discovered and produced in paying quantities from any such well or wells drilled or being drilled at or after the lapse of **ten** years, this lease shall continue in force so long as oil or gas shall be produced from the leased premises.

It is specially agreed that in the event that oil or gas is produced from said premises and said production shall for any reason cease or terminate, lessee shall have the right at any time within ninety (90) days from the cessation of such production to resume drilling operations in the effort to make said leased premises again produce oil or gas, in which event this lease shall remain in force so long as such operations are continuously prosecuted, as defined in the preceding paragraph, and if they result in production of oil or gas, so long thereafter as oil or gas is produced in paying quantities from the premises.

If said lessor owns a less interest in the above described land than the entire and undivided fee simple estate therein, then the royalties and rentals herein provided for shall be paid the said lessor only in proportion which lessor's interest bears to the whole and undivided fee.

Lessee shall have the right to use, free of cost, gas, oil and water produced on said land for all operations thereon, except from water wells of lessor. When requested by lessor, lessee shall bury its pipe line below plow depth. No well shall be drilled nearer than 200 feet to the house or barn now on said premises without the written consent of the lessor. Lessee shall pay for damages caused by all operations to growing crops on said land. Lessee shall have the right at any time to remove all machinery and fixtures placed on said premises, including the right to draw and remove casing.

If the estate of either party hereto is assigned, and the privilege of assigning in whole or in part is expressly allowed, the covenants herofore shall extend to their heirs, executors, administrators, successors or assigns, but no change in the ownership of the land or assignment, of rentals or royalties shall be binding on the lessee until after the lessee has been furnished with a written transfer or assignment or a true copy thereof; and it is hereby agreed in the event this lease shall be assigned as to a part or parts of the above described lands and the assignee or assignees of such part or parts shall fail or make default in the payment of the proportionate part of the rents due from him or them, such default shall not operate to defeat or affect this lease in so far as it covers a part or parts of said lands upon which the said lessee or any assignee thereof shall make due payment of said rental.

Lessee shall have the exclusive right to build, operate and maintain pipe, pipelines, picking stations and plants for the purpose of putting up and marketing the oil and gas from the leased premises and within the land embraced in this lease, whether said oil is produced from lands covered by this lease or other lands and lessor shall be entitled to receive the royalty hereinbefore reserved on all such oil so saved.

In case of cancellation or termination of this lease for any cause, lessee shall have the right to retain under the terms hereof twenty (20) acres of land around each oil or gas well producing, being worked on, or drilling hereunder (as long as such operations are continued in good faith) such tract to be designated by lessee in as near a square form as practicable.

In the event lessor considers that lessee has not complied with all its obligations hereunder, both express and implied, before production has been secured or after production has been secured, lessor shall notify lessee in writing, setting out specifically in what respects lessee has breached this contract. Lessee shall then have sixty (60) days after receipt of said notice within which to meet or commence to meet all or any part of the breaches alleged by lessor. The service of said notice shall be precedent to the bringing of any action by lessor on said lease for any cause, and no such action shall be brought until the lapse of sixty (60) days after service of such notice on lessee. Neither the service of said notice nor the doing of any acts by lessee aimed to meet all or any of the alleged breaches shall be deemed an admission or prescription that lessee has failed to perform all its obligations hereunder.

Title to the minerals vested in grantee under this grant shall not end or revert to grantor until there is a complete, absolute and intentional abandonment by grantee of each and all of the purposes, expressed or implied, of this grant and every part and parcel of the premises described in this grant.

Lessor hereby warrants and agrees to defend the title to the lands herein described, and agrees that the lessee shall have the right at any time to redeem for lessor, by payment, any mortgage, taxes or other liens on the above described lands, in the event of default of payment by lessor, and be subrogated to the rights of the holder thereof, and lessor hereby agrees that any such payment made by the lessee for the lessor shall be deducted from any amounts of money which may become due the lessor under the terms of this lease.

In Testimony Whereof, We have this the

day of

*Wm. B. Rutledge*  
*B. J. Todd*  
*J. H. Todd*  
*Core E. Todd*  
**BY** *B. J. Todd* **V. PRES.**

## JOINT ACKNOWLEDGMENT

THE STATE OF TEXAS,

COUNTY OF Gregg

BEFORE ME, the undersigned, a Notary Public in and for said County and State on this day personally appeared

B. C. Todd

and

Cora L. Todd

his wife, both

known to me to be the persons whose names are subscribed to the foregoing instrument, and acknowledged to me that they each executed the same for the purposes and consideration therein expressed, and the said

Cora L. Todd

wife of the said

B. C. Todd

having been examined by me privily and apart from her husband, and having the same fully explained to her, she, the said Cora L. Todd acknowledged such instrument to be her act and deed, and she declared that she had willingly signed the same for the purposes and consideration therein expressed, and that she did not wish to retract it.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 4<sup>th</sup> day of September A. D. 1931

(L.S.)

Notary Public in and for

GREGG

County, Texas

645—The Odco Company, Publishers—Dallas

going instrument, and having been examined by me privily and apart from her husband, and having the same fully explained to her, she, the said Cora L. Todd acknowledged such instrument to be her act and deed, and she declared that she had willingly signed the same for the purposes and consideration therein expressed, and that she did not wish to retract it.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the day of A. D. 19

(L.S.)

Notary Public in and for

County, Texas

THE STATE OF TEXAS,

COUNTY OF Saltwater

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared

B. C. Todd

known to me to be the person whose name subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed, and the said

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 17 day of August A. D. 1931

(L.S.)

Notary Public in and for

County, Texas

COUNTY CLERK, GREGG COUNTY, TEXAS

Deputy

Given under my hand and Seal of Office in Longview, Texas, this day of 1931

572-5-5 in volume 38 record of DEEDS  
 Certificate of Authentication was on this day, correctly recorded on pages  
 day of 1931, and that the same registered



BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared

*W. J. Todd*

known to me to be the person whose name ~~was~~ subscribed to the foregoing instrument, and acknowledged to me that ~~he~~ executed the same for the purposes and consideration therein expressed, ~~and~~

said

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the

17 day of August A.D. 1931

(L.S.)

Notary Public in and for

*Palmer*

County, Texas.

COUNTY CLERK, GREGG COUNTY, TEXAS

Deputy

Given under my hand and Seal of Office in Longview, Texas, this day of *August* 1931

of Gregg County, Texas

I hereby certify that the foregoing deed or instrument of writing was filed in my office for record at *2:05* o'clock P.M. on the 19th day of August, 1931, and that the same together with the certificate of Authentication was on this day, correctly recorded on pages 562-563 in volume 58 of record of DEEDS

THE STATE OF TEXAS, COUNTY OF GREGG.

40-REVISED  
Texas Standard Form

No. 20612

Oil and Gas Lease

FROM

*W. J. Todd, et al.*

TO

*W. J. Todd, et al.*

Dated July 29th, 1931

No. Acres - - - 25

Gregg County, Texas

Term ten years.

This instrument was filed for record on the

3 day of *Oct* 1931, at *2:05* o'clock P.M., and duly

recorded in Book *1*, Page *1*

records of *Dutch Street* of this office

County Clerk

County, Texas.

By *W. J. Todd* Deputy

When recorded return to

*W. J. Todd, et al.*

*200 Citizens Bank Bldg.,*

*Tyler, TEXAS.*

The Otter Company, Publishers, Dallas

OKLAHOMA SINGLE ACKNOWLEDGMENT  
THE STATE OF ~~OKLAHOMA~~  
COUNTY OF Oklahoma

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared

----- Frank Buttram -----

known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 14 day of September, A. D. 1931.

(L.S.)  
*My commission expires  
on the 25th day of September  
A.D. 1934*

*John G. Chad*  
Notary Public in and for - Oklahoma - - - County, ~~Texas~~ Okla. 14

SINGLE ACKNOWLEDGMENT

THE STATE OF TEXAS,  
COUNTY OF SMITH.

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared

----- L.A. Grelling, Jr., O.M. Boren, and T.B. Ramey, Jr. -----

known to me to be the person whose name are subscribed to the foregoing instrument, and acknowledged to me that they executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 4th. day of September, A. D. 1931.

(L.S.)

*M. Norman*  
Notary Public in and for - - Smith - - - - - County, Texas. 14

642—The Office Company, Publishers—Dallas

THE STATE OF ~~TEXAS~~ SINGLE ACKNOWLEDGMENT  
COUNTY OF ~~TEXAS~~ *My*

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared

~~my commission expires~~  
~~on the 25th day of September 1931~~  
Sept 25 1931

Notary Public in and for - Oklahoma - - - ~~County~~ ~~Okla.~~

14

SINGLE ACKNOWLEDGMENT

THE STATE OF TEXAS,

COUNTY OF SMITH.

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared

- - - - - L.A. Grelling, Jr. O.M. Boren, and T.B. Ramey, Jr. - - - - -

known to me to be the person <sup>B</sup> whose name are subscribed to the foregoing instrument, and acknowledged to me that they executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 4th. day of September, A. D. 1931.

(L.S.)

*Wm Norman*

Notary Public in and for - - Smith - - - - - County, Texas.

243—The Odco Company, Publishers—Dallas

21

SINGLE ACKNOWLEDGMENT

THE STATE OF ~~TEXAS~~

COUNTY OF ~~Smith~~

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared

J. W. Todd

known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 15 day of August A. D. 1931

(L.S.)

*E. H. Bramlett*

Notary Public in and for ~~Smith~~ *Wm* County, ~~Texas~~

243—The Odco Company, Publishers—Dallas

210031

SINGLE ACKNOWLEDGMENT

THE STATE OF TEXAS,

COUNTY OF DALLAS

BEFORE ME, the undersigned, a Notary Public in and for said County and State, on this day personally appeared

B. L. TODD

known to me to be the person whose name 1st subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the 1st day of April, A. D. 1951

(L.S.)

612—The Oden Company, Publishers—Dallas

Notary Public in and for Dallas County, Texas

*46*

CORPORATION ACKNOWLEDGMENT

The State of Texas

County of Harris

Before me, the undersigned authority

Notary Public

of

Harris County, Texas

on this day personally appeared

B. A. Showers, Vice-President

of

Premier Royalty Company, Inc.,

known to me to be the person and officer whose name is subscribed to the foregoing instrument and acknowledged to me that the

same was the act of the said Premier Royalty Company, Inc., a corporation,

and that he executed the same as the act of such corporation for the purpose and consideration therein expressed, and in the capacity therein stated.

GIVEN under my hand and seal of office this

2nd

day of

September

A. D. 1951

Notary Public

Harris County, Texas

*56*

## EXHIBIT B.

Railroad Commission of Texas.  
Oil and Gas Division.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Oil and Gas Dockets Nos. 108, 120, 123, 124, 125, 126,  
128, 129, 132, and 146.

Austin, Texas, May 29, 1934.

Pursuant to notice and hearing Rule No. 37 under Division No. 1, of the amended general conservation rules and regulations of general application in Texas, as promulgated on October 17, 1933, and amended by order promulgated on April 3, 1934, is amended so as hereafter to read as follows:

"Rule 37. Spacing Rule.—No well for oil or gas shall hereafter be drilled nearer than 300 feet to any other completed or drilling well on the same or adjoining tract or farm; and no well shall be drilled nearer than 150 feet to any property line, lease line, or sub-division line; provided that the Commission in order to prevent waste or to prevent the confiscation of property will grant exceptions to permit drilling within shorter distance than above prescribed whenever the Commission shall determine that such exceptions are necessary either to prevent waste or to prevent the confiscation of property. When an exception to such rule is desired, application therefor shall be filed with the Commission fully stating the facts, which application shall be accompanied by a plat drawn to the scale of one inch equalling 400 feet, accurately showing to scale the property on which permit is sought to drill a well under an exception to this rule, and accurately showing to scale all other completed,



drilling and permitted wells on said property; and accurately showing to scale all adjacent surrounding properties and wells. Such application shall be verified by some person acquainted with the facts, stating that all facts therein stated are within the knowledge of the affiant true, and that the accompanying plat is accurately drawn to scale and correctly reflects all pertinent and required data. Such exceptions shall be granted only after at least ten days notice to all adjacent lessees affected thereby has been given, and after public hearing at which all interested parties may appear and be heard, and after the Commission has determined that an exception to such rule is necessary either to prevent waste or to protect the property belonging to applicant from confiscation. All pending applications shall be amended to conform to this rule before being acted upon. Upon similar application and showing the Commission may grant exceptions to the application of this rule in fields where the production is obtained from a formation which is known to be segmented by piercement of intrusive salt plugs.

"In the interest of protecting life and property and for other just and reasonable causes the Commission reserves the right in particular fields to enter special orders increasing the minimum distances provided by this rule.

"No well drilled in violation of this rule without special permit obtained in the manner prescribed in said rule and no well drilled under such a special permit, which does not conform to the terms of such special permit in all respects shall be permitted to produce either oil or gas and any such well so drilled in violation of said rule or in violation of a permit granted under an exception to such rule shall be plugged."

In applying this rule the general order of the Commission with relation to sub-divisions of properties shall be observed.

RAILROAD COMMISSION OF  
TEXAS,

By LON A. SMITH,

Chairman,

C. V. TERRELL,

Commissioner,

ERNEST O. THOMPSON

Commissioner.

Attest:

C. F. PETET,  
Secretary.

(Seal)

jhi

22

EXHIBIT-B-2.

Railroad Commission of Texas.  
Oil and Gas Division.

In Re: Conservation and Prevention of Waste of Crude  
Oil and Natural Gas in the East Texas Field.

Oil and Gas Docket No. 120.

Austin, Texas, May 29, 1934.

Pursuant to notice and hearing in the adoption and amendment of rules and regulations by the Railroad Commission of Texas governing the conservation of crude oil and natural gas and the prevention of waste thereof, and in the light of evidence heretofore introduced at hearings held pursuant to such notices:

It Is Hereby Ordered by the Railroad Commission of Texas that Rule No. 1 of Sub-division II (Drilling) of Division 3, being special rules governing the East Texas Field, is hereby amended so as hereafter to read as follows:

Rule 1. Spacing Rule. No well for oil or gas shall hereafter be drilled in said East Texas Field nearer than 660 feet to any other completed or drilling well on the same or adjacent tract or farm, and no well shall be drilled in said field nearer than 330 feet to any property line, lease line or subdivision line; provided that the Commission in order to prevent waste, or to prevent the confiscation of property will grant exceptions to permit drilling within shorter distances than above prescribed whenever the Commission shall determine that such exceptions are necessary either to prevent waste or to prevent the confiscation of property. When an exception to such rule is desired application therefor shall be filed with the Commission fully stating the facts, which application shall be accompanied by a plat drawn to the scale of one inch equalling four hundred feet, accurately showing to scale the property on which permit is sought to drill a well under an exception to this rule, and accurately showing to scale all other completed, drilling, and permitted wells on said property; and accurately showing to scale all adjacent surrounding properties and wells. Such application shall be verified by some person acquainted with the facts, stating that all facts therein stated are within the knowledge of the affiant true, and that the accompanying plat is accurately drawn to scale and correctly reflects all pertinent and required data. Such exception shall be granted only after at least ten days notice to all adjacent lessees affected thereby has been given, and after public hearing at which all interested parties may appear and be heard, and after the Commission has determined that an exception to such rule is necessary either to prevent waste or to protect the property belonging to applicant from confiscation. All pending applications shall be amended to conform to this rule before being acted upon.

No well drilled in violation of this rule without special permit obtained in the manner prescribed in said



rule, and no well drilled under such a special permit which does not conform in all respects to the terms of such permit, shall be permitted to produce either oil or gas; and any such well so drilled in violation of said rule or in violation of a permit granted as a special exception to said rule shall be plugged.

The order entered by this Commission on August 30, 1933; commonly designated as the direct and equidistant offset order is hereby rescinded, annulled and shall be of no further force and effect. All other rules, regulations and orders of this Commission which conflict with the terms and provisions of Rule No. 1 as hereby amended and promulgated are hereby declared to have no further application to wells in said East Texas Field to the extent of such conflict.

In the adoption and promulgation of this order it is here declared that the Commission intends to adopt each phrase, sentence, and paragraph separately and independently of each other such phrase, sentence, and paragraph, and if any portion of this order or any portion of the rule hereby adopted shall be declared invalid, such declaration and such invalidity shall not affect any other portion.

RAILROAD COMMISSION OF  
TEXAS,

By LON A. SMITH,

Chairman,

C. V. TERRELL,

Commissioner,

ERNEST O. THOMPSON,

Commissioner.

Attest:

C. F. PETET,

Secretary.

(Seal)

b

## EXHIBIT C.

Railroad Commission of Texas.  
Oil and Gas Division.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Oil and Gas Docket Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 & 146.

#20 - 397.

Austin, Texas, August 29, 1938.

Special Order Fixing the Allowable Production of Crude  
Oil in the Various Fields and Districts in Texas.

Whereas, after due notice, hearings have been held in Austin, Texas, at various times, including the hearing on August 19, 1938, with respect to the existence and imminence of waste of oil and gas in the State of Texas, and the prevention thereof; and

Whereas, in view of the evidence, including among other matters the physical conditions in the various fields, the transportation and marketing facilities, the reasonable market demand, the reasonableness of the allocation as between fields of the allowable production under previous orders; and

Whereas, The Railroad Commission of Texas finds from the evidence that the reasonable market demand for oil produced in this State from the various fields and districts therein equals the amount hereinafter shown as the allowable production thereof during the period beginning at 7 o'clock a. m., September 1, 1938, and until further ordered; and

Whereas, The Railroad Commission of Texas finds that waste exists and is imminent and that to prevent such waste of oil and gas as the same is defined by the applicable Statutes, it is necessary to restrict the production of oil in the State of Texas to the reasonable market demand:

Therefore, it is Ordered that beginning at 7 o'clock a. m., September 1, 1938, and until further ordered, the production of oil in the State of Texas and the various fields shown, shall be as hereinafter shown Except as provided for in the Commission's order of August 29, 1938, entitled "General Order" Shutting Down All Oil Wells in the Various Fields and Districts in the State of Texas on September 3rd, 4th, 10th, 11th, 17th, 18th, 24th and 25th.

Rule 2 of Division 2, as contained in an order of this Commission dated October 17, 1933, pertaining to the Panhandle District of Texas is hereby re-adopted and amended as follows:

Rule 2: Not more than Eighty Thousand Seven Hundred Sixty-three (80,763) barrels of crude oil shall be produced from said district during any day of the effective period of this Order. Moore County shall not produce in excess of One Thousand Five Hundred Twenty-nine (1529) barrels daily. Moore County allowable is in addition to Panhandle allowable. The Osborne Area in Wheeler County shall not produce in excess of Six Hundred Twenty (620) barrels of crude oil daily. The Osborne Area allowable is in addition to the Panhandle allowable.

2. Rule 23 (a) of Division 3, as contained in an order of this Commission dated October 17, 1933, pertaining to the East Texas Field is hereby re-adopted and amended as follows:

24       Whereas, The Railroad Commission of Texas finds from evidence submitted to it at a hearing held in Austin on August 19, 1938, and at previous hearings held before the regulatory body that the reservoir of the East Texas Field has its energy supplied by a hydrostatic drive which encroaches from the west to the east, and only a certain amount of crude oil can be withdrawn daily from the East Texas Reservoir in order to utilize to the greatest extent the energy necessary for the production and recovery of the greatest amount of oil ultimately from the reservoir. It has been recommended to the Commission by competent engineers that not more than 425,000 to 450,000 barrels of crude oil should be allowed to be produced from the East Texas Reservoir in any one day in order that the reservoir might be depleted with the least possible amount of waste incurring. Evidence has also been submitted to the Commission at these hearings that the production of from 425,000 to 450,000 barrels of crude oil will prohibit the coning of water, the uneven encroachment of water, and the subsequent trapping of much oil with otherwise, under higher daily allowables of crude oil, would not be recovered.

Rule 23 (a). Therefore, it is Further Ordered by the Railroad Commission of Texas that during each twenty-four (24) hour period beginning at 7 o'clock a. m., Central Standard Time, September 1, 1938, the owner or operator or manager of each well in the East Texas Field shall be permitted either collectively or individually, to produce daily from each well a maximum of Two and Thirty-two Hundredths (2.32%) Per Cent of its hourly potential capacity as determined by the Commission.

3. Rule 2 of Division 5, as contained in an Order of this Commission dated October 17, 1933, pertaining to the North Texas District, is hereby re-adopted and amended as follows:

Rule 2. Not more than Eighty-eight Thousand and Eight (88,008) barrels of crude oil shall be produced from said district during any day of the effective period of this order, which is distributed in the following manner:

North Texas Proper, Anderson - Kerr, 65,747.

Gant Pool, 340.

Foard County, 688.

K. M. A., 21,233.

4. Rule 2 of Division 6, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Central Texas District is hereby re-adopted and amended as follows:

Rule 2. Not more than Seventy-nine Thousand and Sixty-seven (79,067) barrels of crude oil shall be produced from said district during any day of the effective period of this order, which is distributed to the various counties as follows:

Brown .....	2086	Jones .....	7264
Callahan .....	1450	McCullough .....	25
Coleman .....	1217	Palo Pinto .....	370
Comanche .....	79	Reagan (Big Lake) .....	7500
Crockett (Crockett) .....	266	Reagan (Grayson) .....	151
Crockett (Todd) .....	0	Runnels .....	147
Crockett (Simpson) .....	50	Shackelford .....	7396
Crockett (World) .....	1047	Stephens .....	4393
Eastland .....	2973	Stonewall .....	100
Erath .....	76	Taylor .....	74
Irion .....	40	Throckmorton .....	399
Fisher .....	4215	Upton (McCamey) .....	19662
Haskell .....	227	Upton (Herrington Ex-	
Hurdle .....	245	tension) .....	196
Jack (So. Half) .....	9939	Webb Ray .....	79
		Young (So. Half) .....	7401

Rule 4 of Division 7, as contained in an order of the Commission dated October 17, 1933, pertaining to the West Texas District is hereby readopted and amended as follows:

Rule 4. Not more than Two Hundred Twenty Three Thousand Five Seventy Eight (223,578) barrels of crude oil per day shall be produced from said district during any day of the effective period of this Order, which shall be distributed to the various fields therein as follows:

Bashara	176	McClintic	1211
Bennett	2978	Monroe	24
Carter	20	Moore	80
Church Fields	6633	Netterville	378
Cowden, North	8735	Northwest	39
Cowden, South	347	Parker	33
Cowden, Crane	2357	Payton	1216
Dean	80	Pecos Valley	993
Deep Rock	236	Penwell	4710
Dobbs	9	Richards	0
Duggan	518	Sand Hills (Permian)	1293
Edwards	10	Sand Hills (Ordovic-	
Emperor	1558	ian)	260
Estes	8510	Scanlan	0
Eaves	371	Scarborough	2075
Foster	6526	Sealey	503
Fuhrman	1554	Seminole	511
Garza County	41	Shearer	98
Goldsmith	21812	Shipley	1688
Gulf-McElroy	4422	Slaughter	683
Hall	559	Snyder	1486
Harper	11954	Taylor Link	1300
Hendricks	12000	Tobarg	2048
Henderson	3500	Waddell	1469
Howard-Glasscock	17773	Ward, North	6706



Iatan-E. Howard	7807	Ward, Sough	12320
Johnson	43	Wasson	7828
Jordan	2586	West	60
Kermit	20074	Westbrook	922
Keystone	3365	Wheat	1527
Leck	340	White-Baker	0
Mason	395	Wilson	0
Masterson	618	Yates	21072
Means	2988	Yates (Smith Sand)	150

6. Rule 2 of Division 4, as contained in an order of this Commission dated October 17, 1933, pertaining to the East Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than One Hundred Twelve Thousand One Hundred Sixty Three (112,163) barrels of crude oil per day shall be produced from said field in said district during any day of the effective period of this order. Said amounts shall be allocated to the various fields in the following amounts:

Boggy Creek	450	Post Oak	10
Bolivar	28	Powell	2163
Cayuga	11059	Potter	162
Collinsville	10	Percilla	24
Corsicana Shallow	435	Richland	25
Curry	122	Rodessa	31996
Flag Lake	583	Rusk	92
Ginter	50	Sulphur Bluff	6205
Grapeland	100	Shelbyville	30
Huntington	18	South Bosque	18
Lone Star		Talco	33,661
Long Lake	2787	Trinity	757
Lott	70	Van	18725
Mexia	1948	Van Shallow	142
Navarro Crossing	200	Waskom	114
Opelika	30	Wortham	85
Ranola	47	Wortham (Shallow)	12
Pottsboro	5		

7. Rule 2 of Section "A" of Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Southwest Texas District is hereby re-adopted and amended as follows:

Rule 2. Not more than Two Hundred Ninety Two Thousand Eight Hundred Five (292,805) barrels of crude oil shall be produced in said district during any day of the effective period of this order and same shall be distributed as follows:

#### Division I.

Alta Vista	4	Hantho-Nelson	0
Bateman	135	Hilbig	396
Batesville, New	5	Jacobs	616
Berlin, New	0	Jones	3
Bob Rose	10	Kimbrow	11
Buchanan	240	Larremore	81
Burdett Wells	38	Loma Alto	115
Calliham	215	Lost Mule	0
Carroll	60	Luling Branyon	11857
Carver-Kallison	143	Lytton Springs	342
Cedar Creek	29	Manford	22
Cedar Creek No.	39	Matthews	24
Chapman-Abbott	252	Minerva Rockdale	200
Chicon Lake	21	Noack	89
Clark	145	Pearsall	693
Darst Creek	9011	Salt Flat	5107
Deupree	41	Somerset	674
Dale	171	Southton	64
Dale, West	230	Spiller	64
Dunlap	180	Staples	1
Dunlay	39	Riddle	148
Eckert	159	Taylor Inn	8
Ellison-Young	155	Thrall	39
Ezzell	4507	Von Ormy	193
Espada Mission	1	Von Ormy	75
Fairfield	7	Walnut Creek	48
Gas Ridge	8	Zoboroski	137

## Division II.

Burnell, South	1099	Mt. Lucas	69
Caesar	324	Normanna	45
Colletto Creek	619	Oakville	138
Cordeil	588	O'Connor McFadden	248
Diamond Half	477	Pettus	835
Dinero	77	Pettus New	1164
Dirks	2679	Placedo	9493
East Telfner	120	Placedo, East	392
Ganado	44	Plummer	286
Greta	8294	Port Lavaca	58
Greta Deep	361	Ray	438
Ieyser	11300	Refugio-Fox	843
Holzmark	34	Refugio-New	3977
Hordes Creek	49	Refugio-Old	1515
Keeran	611	Sarco	0
McMurray	4	Slick	10
McFadden	1568	Tom O'Connor	15538
McNeil	82	Tuleta	502
Mauritz	176	Vanderbilt	73
Mineral	0	Voss	25

## Division IV.

Agua Dulce	47	London	75
Albercas	61	Loma Novia	15253
Alfred	278	Lopez	7225
Alice	2058	Los Olmes	125
Alta Mesa	668	Loma Vista	10
Alta Verde	12	Luby	7128
Angelita	21	Lundell	476
Aransas	7429	Midway	1028
Aviators	371	Mirando City	455
Baldwin	472	Mirando Valley	278
Barbacoas	9	Moca	446
Benavides	13665	Nelson	17

Bruni	605	O'Hern	7704
Bruni East	345	Oilton	2867
Captain Lucey	271	Las Animás	75
Carolina-Texas	8	Peters	132
Casa Blanca	611	Piedre Lumbre	1296
Chapman	74	Piedras Pintas	2
Charamousca	342	Plymouth	13305
Charco-Redondo	14	East Premont	264
Clara Driscoll	1523	Premont Prospect	702
Clara Driscoll So.	667	Rancho Solo	16
Cole Middle	20	Randado	327
Cole West	457	Ricaby	7
Colmena	362	Richard King	472
Colorado	319	Rio Grande City	110
Comitas (Haynes)	743	Rincon	98
Corpus Christi	4553	Roma	1
Cuellar	115	Sandia	13
Driscoll	1897	Sarnosa	768
Eagle Hill	424	Sam Fordyce	3566
El Tanque	268	Sam Fordyce North	343
Escobas	1418	Saxet	19893
Fitzsimmons	612	Saxet Frio	20647
Flour Bluff	5927	Seven Sisters	8874
Govt. Wells No.	8810	Seven Sisters So.	594
Govt Wells So.	4725	Sinton	8
Henne-Winch-Farris	14	Stratton	410
Guerra	837	Sullivan	108
Hoffman	3692	Sweden	286
Jennings	1068	Taft	2766
Killam	1352	Tesoro	196
Kingsville	69	Thomas Lockhart	5
Kohler	114	Turkey Creek	3708
Kehler Deep	51	White Point	28
Labbe	320	White Point East	1960
Laurel	11		

8. Rule 2 of Section A, Division 9, as contained in an Order of the Commission dated October 17, 1933, pertaining to the Gulf Coast District is hereby readopted and amended as follows:

Rule 2. Not more than Two Hundred Fifty Four Thousand Eight Hundred Thirteen (254,813) barrels of crude oil shall be produced from said field of said district during any day of the effective period of this order, which shall be distributed as follows:

Allen Dome	12	Lost Lake	135
Amelia	4399	Louise	1560
Anahuac	9832	Lovell's Lake	127
Ariola	564	Livingston	2362
Armour	167	Magnet	1194
Bammel	98	Manvel Miocene	5884
Barson	1136	Manvel Oligocene	5445
Batson New	1118	Markham	1922
Barbers Hill	10762	Mykawa	200
Bay City	2726	Mykawa New	1447
Big Creek	728	Nash Dome	-0-
Big Hill		Nome	1764
Blue Ridge	802	North Dayton	120
Boling	2010	Old Ocean	5328
Brenham	35	Orange	697
Brookshire	10	Orange West	1080
Buckeye	196	Orchard	350
Call	49	Palacios	120
Cedar Point	457	Pickett Ridge	1620
Cheek	106	Port Neches	1274
Clam Lake	98	Port Neches West	148
Clay Creek	663	Pierce Junction	5216
Cleveland	450	Raccoon Bend	1598
Clintorr	463	Raccoon Bend (Cock-	
Conroe	39368	field)	2460



Cotton Lake .....	6	Rockland .....	
Cotton Lake So. ....	1157	Sandy Point .....	385
Damon Mound .....	366	Saratoga .....	1008
Danbury Dome .....	588	Satsuma .....	364
Dickinson .....	5275	Schwab .....	78
Esperson Dome .....	1608	Seabreeze .....	226
Eureka Heights .....	1101	Segno .....	2211
Fairbanks .....	4131	Segno Deep .....	150
Fannet .....	719	Shepherd's Mott ...	-0-
Gillock .....	3744	Silsbee .....	2166
Goose Creek .....	2075	Sour Lake .....	1491
Greens Lake .....	19	South Houston .....	3861
Hamman .....	1976	South Liberty .....	673
Hankamer .....	1328	Spindletop .....	2926
Hankamer New .....	264	Sugarland .....	3994
Hardin .....	5488	Thompsons .....	13108
Hardin West .....		Tomball .....	8924
Hastings .....	24333	Turtle Bay .....	1430
High Island .....	2690	Webster .....	3763
Hitchcock .....	686	West Beaumont .....	1728
Hull (Old) .....	3376	West Columbia .....	2186
Hull (New) .....	7640	West Columbia New ..	3618
Humble .....	4362	West Columbia Vicks.	39
Joe's Lake .....	1070	Wilson .....	73
Kubela .....	702	Willow Slough .....	381
LaBelle .....	20	Withers .....	3787
Lochridge .....	2575		

It is Further Ordered that allowable oil in the foregoing Order is measured on 100 per cent tank tables according to the Pipe Line Rule Number Nine (9), and corrected to sixty (60) degrees Fahrenheit.

It is Further Ordered that this Cause be held open on the Docket for such further orders as may be necessary and supported by evidence of record in the above Cause.

RAILROAD COMMISSION OF  
TEXAS,

C. V. TERRELL, Chairman,  
ERNEST O. THOMPSON,  
Commissioner.

(Seal)

Attest:

C. F. PETET, Secretary.

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EXHIBIT D.

State of Texas,  
Railroad Commission of Texas,  
Austin.

#6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,  
23, 24, 25 B. C. Todd et al.

Wm. H. Castleberry Survey, Gregg County, Texas.

Case No. 25,545.

Rule 37.

Applicant: Rowan & Nichols, 903 Trinity Life Building,  
Fort Worth, Texas.

The application of Rowan & Nichols for an exception under the provisions of Rule 37, coming on to be heard on the 11th day of March, 1938, by the Railroad Commission of Texas, and it appearing that the petition shows good

cause; that no injustice will be done by the granting of such exception, and that same should be granted to prevent confiscation of property:

Now, Therefore, it is Ordered, that the application of Rowan & Nichols for an exception under the provisions of Rule 37 and a permit to drill well No. 6, B. C. Todd et al Lease, containing 25 acres of land out of the Wm. H. Castleberry Survey in Gregg County, Texas, as shown by plat submitted, is hereby approved and applicant is granted permission to drill well No. 6 to be spaced as follows:

As a direct northwest and equidistant offset to R. M. Wood No. 1, fee.

It is Further Ordered that all other requests are hereby denied.

Entered at Austin, Texas, on this the 17th day of March, 1938.

C. V. TERRELL,

Chairman.

LON A. SMITH,

Commissioner.

.....  
Commissioner.

Attest:

C. F. PETET,

Secretary.

The above and foregoing is a true and correct copy of an order of the Railroad Commission of Texas, entered on the above date.

LATEN STANBERRY,

Chief Supervisor, Oil and  
Gas Division.

em

## EXHIBIT E.

Before the Railroad Commission of Texas, Oil & Gas  
Division.

In the Matter of: Application of Rowan & Nichols Oil  
Company for adjustment in allowable and, alterna-  
tively, for twenty permits as exceptions to Rule 37.

No. 25,545 and East Texas Proration Docket No. ....

Comes now Rowan & Nichols Oil Company, applicant  
in the above styled and numbered application, heretofore  
filed with the Railroad Commission of Texas on February  
24, 1938, and moves that the action of the Railroad Com-  
mission of March 17, 1938, in denying applicant's request  
for an adjustment in the allowable of what is known as  
its Todd "B" lease, consisting of 24.99 acres, Castleberry  
Survey, Gregg County, Texas, and denying its alternative  
request, in the event said applicant had no lawful right to  
an adjustment of allowable, for twenty permits to drill  
wells as an exception to Rule 37 on said lease, and the  
granting of only its application for Well No. 6 as an equi-  
distant offset to the R. M. Wood Well No. 1, Wood Fee,  
Castleberry Survey, Gregg County, be set aside and held  
for naught, for the following good and sufficient reasons:

## I.

Applicant has drilled and is producing five wells on  
said lease, in accordance with the rules, regulations and  
orders of the Railroad Commission.

## II.

Said lease is located in what is known as the Glade-  
water Nose and the "fairway," with an average sand

thickness underlying said lease of one hundred (100) feet, and an average potential per well on said lease of 964 barrels, and with a present allowable on said lease for all five wells of 112 barrels per day.

### III.

Taking into consideration the elements of porosity, permeability, oil saturation, and thickness of sand underlying said lease, applicant is not receiving and does not have an opportunity equal to other operators and lease owners in the field, to recover its fair share of the oil.

### IV.

Applicant is entitled to that proportion of the total daily allowable for the East Texas Field as the recoverable oil under its lease bears to the total recoverable oil in the East Texas Field, but under the present proration orders and the basis therefor, applicant is being deprived of said equal opportunity without due process of law, and is not receiving the equal protection of the laws guaranteed to it by the Constitution and laws of the State of Texas and of the United States.

### V.

Applicant can produce from the wells now producing on its lease without waste, that proportion of the total daily allowable that the recoverable oil under its lease bears to the total recoverable oil in the East Texas Field, without the necessity of drilling additional wells.

### VI.

The granting of its application for Well No. 6, and the production of oil therefrom, under the present basis of



proration, will continue to deprive and does not grant and and will not guarantee to applicant an equal opportunity to recover its fair share of the oil, and results in the Rail-

road Commission's depriving applicant of produc-  
 31 ing per day that proportion of the daily allowable that the total recoverable oil under its lease bears to the total recoverable oil of the East Texas Field, unjustly, inequitably, and contrary to the Constitution and laws of the State of Texas and the United States.

Wherefore, applicant prays that this motion for rehearing be granted, that the order of the Commission heretofore entered on March 17, be set aside and held for naught, and that upon rehearing, the statewide proration order made by said Commission on the 22nd day of March, 1938, on hearing held at Austin on March 19, 1938, be set aside and re-entered or amended so as to give applicant the relief sought at said hearing.

It is also most respectfully urged and prayed that in view of the litigation pending involving, and various claims to, the title to the southern part of applicant's lease and the bona fide title dispute that R. M. Wood claims exists, the Railroad Commission inform this applicant just where the Well No. 6 granted to applicant would be.

Respectfully submitted,

RICE M. TILLEY,

PHILLIP TOCKER,

Attorneys for Applicant,

Rowan & Nichols Oil

Company.

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## EXHIBIT F.

State of Texas.

Railroad Commission of Texas,  
Austin.

Motion for Rehearing by Tilley and Tocker, Attorneys for  
Rowan and Nichols Oil Company, Applicant.

Case No. 25,545.

Rule 37.

Applicant: Rowan & Nichols Oil Company, 903 Trinity  
Life Building, Fort Worth, Texas.

Motion for rehearing in the above numbered case having this date been considered by the Railroad Commission of Texas, and it appearing that the reasons set out in said motion are sufficient to justify the granting of a rehearing covering the application of Rowan & Nichols Oil Company for an adjustment of allowable or in lieu thereof, special permit to drill wells Nos. 7 to 25 inclusive on the B. C. Todd et al lease, containing 25 acres of land out of the Wm. H. Castleberry Survey in Gregg County, Texas;

Now, therefore, it is Ordered that the motion for rehearing filed by Tilley and Tocker, Attorneys for Rowan & Nichols Oil Company, applicant in the above numbered case, is hereby granted.

Entered at Austin, Texas, on this the 31st day of March,  
1938.

C. V. TERRELL,

Chairman.

LON A. SMITH,

Commissioner.

ERNEST O. THOMPSON,

Commissioner.

Attest:

C. F. PETET,

Secretary.

The above and foregoing is a true and correct copy of an order of the Railroad Commission entered on the above date.

LATEN STANBERRY,  
Chief Supervisor, Oil and  
Gas Division.

em

33 Complainant's Original Bill of Complaint. Filed  
7th day of September, 1938, at 3:30 O'Clock P. M.

34 AMENDMENT TO ORIGINAL BILL OF COM-  
PLAINT.

(Title Omitted.)

To said Honorable Court:

Comes now Rowan & Nichols Oil Company, complainant in the above styled and numbered cause, leave of Court having first been had, and files this amendment to its original complaint herein and amends Paragraph X thereof by adding at the end thereof Paragraph X-A, as follows:

X-A.

(1) That said present plant of proration based on potential allocates the allowable on a well basis and does not take into consideration the productive capacity of the tract on which the same is located or the well, and said potential factor and basis as now used is unfair and inequitable and does not correctly reflect the thickness and character as to the richness and yield of the underlying sands, the ability of said well or tract to produce, or the recoverable oil underlying any particular tract and/or well, nor the proportionate share of oil that any oper-

ator is entitled to for the following good and sufficient reasons: (a) the amount of oil that an operator recovers depends primarily upon the number of wells he is permitted to drill rather than upon the amount of oil that was originally in place under his land; (b) thus increasing unnecessarily the expense of operation; (c) a potential does not measure the ability of a well to produce ultimately, but only at the time the potential is taken; (d) wells of high productivity obtain invariably a greater proportion of the oil than under unrestricted operating conditions; (e) oil is of necessity measured by units of volume, and potential, therefore, is accurate only if computed on the basis of a potential per acre foot of sand; (f) results obtained by potential tests now made reflect strongly the influence of flow string equipment rather than the desired pay zone conditions; (g) said basis does not take into consideration the amount of pressure being used by various operators to lift the oil; (h) in the purchase and sale of properties in the East Texas oil fields and the taxing of same the acreage factor is of primary importance and consideration, because said property is sold and taxed on a per acre basis, considering improvements thereon; and (i) a potential basis is inaccurate, wasteful and dangerous as a fire hazard.

(2) The operators of more closely drilled tracts should not be given an advantage over operators of less closely drilled tracts in the production of oil because the drilling of a large number of wells on a tract will not increase the total recoverable oil in the field because: (a) the rate of extraction or economical use of the reservoir energy determines the ultimate recovery and not the number of holes in the ground; (b) because in a water driven field such as East Texas proper control of withdrawals make close spacing of little or no importance; (c) because under this theory an operator receives more

oil only because his allowable is not adjusted and not because additional wells increase total ultimate recovery; and (d) because the drilling of such additional wells is not necessary at this time nor has it been in the past, and one well to ten acres will certainly for the  
 36 next ten years on the present daily allowable will not require the drilling of more wells, and therefore, said wells are unnecessary wells at this time, and the only purpose in drilling the same is greed on the part of such operator to recover more than his fair share of the oil, more than the recoverable oil underneath his lease, and not for the purpose of recovering oil that would not otherwise be recovered because any such amount of oil, if any there might be that would otherwise be recoverable, would not justify 1/10th the cost of the drilling of such well.

(3) That all wells are allowed to produce 2.32% of their potential except marginal wells, which have a potential of not more than 20 barrels per day, although said so-called marginal wells are located on the poorest and worst part of the structure in said field, are least prolific, generally go on the pump first, have the poorest bottom-hole pressure, sand thickness and are otherwise most unfavorably situated and to permit said wells to produce not less than 20 barrels results in the oil migrating from complainant's lease to said pumping wells, thereby resulting in confiscation of complainant's property and the taking of complainant's oil from its wells, favorably situated as they are on the structure, and giving it to the operators of pumping wells most unfavorably situated by reason of which said marginal well law, and the orders promulgated thereunder are obnoxious and repugnant and in contradiction to the other laws of this State relating to waste and the production of oil and are invalid and unconstitutional because they are discriminatory, capricious, and based upon an arbitrary meas-



ure or basis for allocating the allowable, depriving complainant of its property without due process of law and denying it the equal protection of the law, which said marginal well law was passed at the Regular Session of the Forty-second Legislature, 1931, and which is known as Article 6049-B, Vernon's Annotated Statutes, Chapter 58, Act of the Regular Session, as amended.

37. (4) That if complainant and all others similarly situated were allowed to produce at the rate which complainant contends for, there will not be a rapid drop in the bottom-hole pressure of the East Texas field, and gas will not come out of solution, leaving enormous quantities of oil in the reservoir, because one well will reasonably and adequately drain the oil from ten acres as aforesaid, there are thousands and thousands of wells throughout the field more densely spaced than complainant's, and most of said wells are the second to tenth wells on tracts of less than ten acres owned by one operator on one tract; that not only under the present plan of proration are said wells and operators confiscating the oil, or a large percentage thereof, which complainant is entitled to recover, but said wells and operators are, by said unnecessary and excessive number of wells, using an unnecessary, unfair, inequitable and disproportional amount of the reservoir energy necessary to produce their fair share of the oil, and are thus confiscating and dissipating the reservoir energy which complainant is entitled to, and which will thus be dissipated and exhausted prematurely, forcing complainant to prematurely place its wells on the pump, at great expense, and preventing complainant from ultimately recovering its fair share of the recoverable oil in the time, manner and quantity herein more fully alleged.

(5) That an adjustment in allowable has been sued for before said Commission at numerous hearings as hereinbefore more fully alleged, and all the allegations herein made were made before said Commission, and competent evidence was offered uncontradicted in support thereof. That the said Commission has adopted factors necessary to give complainant its fair share of the oil in similar fields throughout Texas, and said factors being known to it in the East Texas field, such an order could  
 38 and should be adopted there, but for reasons and purposes inconsistent with their duty to the State of Texas and this complainant, they have deliberately failed and refused to embrace such factors in such an order and thereby are unnecessarily and inexcusably confiscating complainant's property.

(6) That since the filing of this complaint, Jerry Sadler has succeeded said C. V. Terrell as a member of said Commission, and Lon A. Smith has succeeded as Chairman of said Commission, and Gerald C. Mann has succeeded said McCraw as Attorney General, and said orders hereinbefore complained of have been re-adopted and said allegations herein made are directed to said new parties.

Wherefore, complainant prays as in its original bill of complaint.

DAN MOODY,  
 RICE M. TILLEY,  
 PHILLIP TOCKER.

Amendment to Original Bill of Complaint. Filed January 17, 1939.

## AMENDED ANSWER OF RESPONDENTS.

(Title Omitted.)

To the Honorable Court aforesaid:

## I.

Defenses to Claims for Relief Set Forth in  
Paragraph III.

(1) Respondents admit that complainant is the owner of an oil, gas and mineral leasehold estate in a certain 24.99 acre tract situated and located in the W. H. Castleberry League in Gregg County, Texas, B. C. Todd, et al, fee owners.

(2) Respondents admit that complainant has five wells drilled in accordance with existing rules, regulations, and orders of the Railroad Commission and produces oil from said land.

(3) Respondents admit that complainant was, at the time of the filing of the complaint, producing from said lease in accordance with the order of the Railroad Commission of Texas dated August 29, 1938, the following number of barrels of oil per day: Well No. 1, 22.388; Well No. 2, 22.272; Well No. 3, 22.388; Well No. 4, 22.504; and Well No. 5, 22.272.

## II.

Defenses to Claims for Relief Set Forth in  
Paragraph IV.

(1) Respondents admit that complainant's lease and the wells thereon are located in what is known as the East Texas Oil Field.

(2) Respondents admit that said field is water driven and embraces a territory of about forty miles in length and an average of four miles in width. The respondents allege, however, that the field is more than four miles in width in the East-West direction in that portion of the field where complainant's wells are located.

(3) Respondents admit that the West side of the field is underlain with what is known as bottom water, and that no water underlies the East one-half and that water is slowly but perceptibly rising in the Western portion thereof.

(4) Respondents deny that one well to 10 acres can reasonably drain such area in the East Texas field during the flowing life thereof.

(5) Respondents admit that the field is at the present time substantially a flowing field, but deny that it will remain a flowing field throughout its life, and allege that the field is now a flowing field only because of the restrictions in rate of production which have been placed on it by the Railroad Commission of Texas.

(6) Respondents admit that there are approximately 133,000 acres underlain by oil in said field, but respondents say that they are without knowledge or information sufficient to form a belief as to the truth of the averment that the average sand thickness of the oil bearing sand is 42 feet, or that the said thickness under the complainant's lease is 100 feet.

41 (7) Respondents say that they are without knowledge or information sufficient to form a belief as to the truth of the averment that there are 5,586,000 acre feet of oil sand in the entire field or that there are 2,499 acre feet of oil sand under complainant's

lease, and in this connection respondents aver that the number of acre feet of oil sand in the entire field and under complainant's lease cannot be ascertained with sufficient accuracy to be a proper basis for the proration of the allowable production of oil in the East Texas field.

(8) Respondents admit that as of August 31, 1938, the total production of oil from said field was approximately 1,238,080,665 barrels and that the production of oil from complainant's lease as of August 31, 1938, was 345,165.59 barrels.

(9) Respondents admit that the average controlled potential in the East Texas Field is 605 barrels and the average controlled potential of each well on complainant's lease is 964 barrels.

(10) Respondents admit that as of August 30, 1938, there were approximately 25,500 wells producing and authorized to be drilled in said field.

(11) Respondents admit that sixty per cent of these wells were allowed as exceptions to Rule 37 of the rules and regulations of the Railroad Commission, and allege that all of the five wells on the complainant's lease were also drilled as exceptions to Rule 37 of the rules and regulations of the Railroad Commission.

(12) Respondents deny that the uncontrolled potential of the wells in said field varies from less than 20 barrels per well to 30,000 barrels per well per day.

(13) Respondents admit that the complainant's wells are situated in what is known as the "Gladewater Nose", and admit that these wells are very favorably situated on the structure and producing horizon of the East Texas field.

42 (14) Respondents deny that complainant's wells are equidistant between the East and West lines of the field, but allege that the complainant's wells are located approximately 4.9 miles from the Western edge of said field and only 3.3 miles from the Eastern edge of said field.

(15) Respondents say that they are without knowledge or information sufficient to form a belief as to the truth of the averments that the oil saturated sands under the complainant's wells are of maximum thickness, but admit that there is no danger of encroachment of water on said wells at the present time, and for a long time to come.

(16) Respondents admit that said wells can be continually produced for many months without excessive gas-oil ratio and without physical waste under the present system of regulation imposed by the Railroad Commission, but deny that these wells will produce without waste if they are not limited in accordance with the present system of regulation.

(17) Respondents say that they are without knowledge or information sufficient to form a belief as to the truth of the averments that the oil producing sands to the East of the complainant's properties are continually decreasing in thickness, but admit that these sands pinch to nothing on the Eastern edge.

(18) Respondents deny that all of the wells lying between complainant's property and the Eastern edge are incapable of producing nearly as much oil as complainant's wells, but admit that none of the wells lying between complainant's property and the Western edge of the field are capable of producing for as long a time as complainant's wells, and further allege that complainant's



43 well will produce longer than practically all of the wells lying between complainant's property and the Western edge of the field only because of the restrictions which the Railroad Commission is now requiring.

(19) Respondents say that they are without knowledge or information sufficient to form a belief as to the truth of the averments that the total recoverable oil under complainant's lease is approximately 57,000 barrels per acre and that the total recoverable oil in the common pool existing in the East Texas field is approximately 2,500,000,000 barrels.

### III.

#### Defenses to Claims for Relief Set Forth in Paragraph V.

(1) Respondents deny that information as to the sand thickness, properties of the reservoir sands and their fluid content can be determined in a field such as the East Texas Field with sufficient accuracy to make it possible to estimate the quantity of oil and gas in the various portions of such field with sufficient precision to make an equitable allocation of production on the basis of such estimate. In this connection, respondents aver that in a field such as the East Texas field a system of allocation which gives each owner of a lease in this field an allowable which bears the same relation to the total allowable of the field that the reserves under his tract bear to the total reserves in the field, would not insure to the owners of each tract of land in such a field the amount of oil that he has underlying his tract. The reason for this is that the East Texas field is a water driven field. Water lies all along the Western edge of the field and as oil is produced from the field, the water

encroaches from the Western edge and pushes oil toward the East. Owners of wells on the Western edge of the field, therefore, will not, under any system of allocation, obtain the amount of oil which they have in place under their leases.

44

## IV.

Defenses to Claims for Relief Set Forth in  
Paragraph VII.

(1) Respondents deny that complainant would drain only its fair share of the oil through the wells located on its lease at the present time if its daily allowable bore the same relation to the total daily allowable as the recoverable oil thereunder bears to the total recoverable oil in the field, but allege that under such a system complainant would drain more than its fair share of the total recoverable oil in the field.

(2) Respondents admit that the allowable in said field are adjusted on the basis of controlled potential of said wells as determined by the Railroad Commission, but deny that these potentials are fiction, and deny that the complainant is placed in the position of surrendering its property through drainage or being compelled to drill additional or unnecessary wells.

(3) Respondents admit that they do not take into consideration the cost of drilling offsets to prevent drainage of his property under the system of allocation of the allowable.

(4) Respondents says that they are without knowledge or information sufficient to form a belief as to the truth of the averments that complainant's allowable does not bear the same relationship to the total allowable

as the recoverable oil under its lease bears to the total recoverable oil in the East Texas field.

(5) Respondents say that they are without knowledge or information sufficient to form a belief as to the truth of the averment that the Commission's allowable if based on such formula will approximate 235 barrels per days, but admit that the Commission's allowable upon complainant's wells now approximates 112 barrels per day.

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V.

### Defenses to Claims for Relief Set Forth in Paragraph VIII.

(1) Respondents admit that the present plan of pro-rata does not take into consideration acreage of leases, or density of drilling on leases, and admit that an operator having a well on one acre of land may recover ultimately ten times as many barrels of oil per acre as an operator on an adjoining lease which has a density of only one well to ten acres. This, however, could not in any manner cause irreparable damage to complainant for the reason that the density of drilling around complainant's lease is on an average no greater than the density of drilling on complainant's lease, and the oil under complainant's tract is constantly being replenished by oil drained from tracts to the west of complainant's tract.

(2) Respondents admit that operators of a more closely drilled tract are given advantage over operators of less closely drilled tracts in the production of oil, but allege that this advantage should be given because the drilling of a larger number of wells under regulation of the Railroad Commission of Texas on a tract will increase the total recoverable oil in the field.

(3) Respondents admit that they granted a permit to R. M. Wood on a strip immediately to the south of complainant's lease, comprising approximately one acre and that he has been and is being permitted to produce from said well since its completion on August 22, 1937, 22,272 barrels per day, and that the allowable on each of the five wells on complainant's lease is approximately the same.

(4) Respondents deny, however, that said R. M. Wood will by an order of the Commission take complainant's oil, but allege that complainant has not and will not suffer from drainage under the present system of allocation.

46. (5) Respondents admit that there are contained in the East Texas field many hundreds of tracts of land of less than five acres, and of less than ten acres, on which the Commission has authorized the drilling of wells, but deny that this drilling has been on the average of one well to one acre.

(6) Respondents further allege that the density of drilling in the area around complainant's lease, and in the field as a whole, is no greater than the density of drilling on complainant's lease.

(7) Respondents deny that by reason of the present system of proration the wells lying to the East of complainant's lease have as much oil as same had originally thereunder, but allege that the wells to the east of complainant's lease have a smaller portion on the average of the oil which was originally in place than the complainant's lease. This is caused by the fact that the pressure in the oil sand under complainant's lease is on an average higher than the pressures under the leases

to the East of complainant's lease and, therefore, the reserves have decreased to a lesser extent.

(8) Respondents deny that the rate of withdrawal from every well to the East of complainant's lease is equal to the allowable on complainant's well.

(9) Respondents deny that the rate of withdrawal from every well to the east of complainant's lease is equal to the allowable on complainant's wells.

(10) Respondents deny that complainant has been drained of recoverable oil under the respondent's system of proration, and deny that the reserves of the leases more densely drilled than the complainant's lease have arisen and will continue to rise and deny that the complainant's reserves have decreased and will continue to decrease.

47 (11) Respondents deny that, if the present proration plan is maintained, complainant will lose oil which it is entitled to long prior to the exhaustion of the oil and gas in the reservoir, but allege that the reservoir will be largely exhausted by the time complainant's wells are drowned out because of the fact that complainant's wells are now located almost five miles from the Western edge of the field.

(12) Respondents deny that its proration order is discriminatory, confiscatory, oppressive and grossly inequitable.

## VI.

### Defenses to Claims for Relief Set Forth in Paragraph IX.

(1) Respondents admit that complainant is entitled to recover oil ratably with other owners in the East.

Texas field, and in this connection, respondents aver that the present method of proration of the allowable production of oil gives consideration to all proper determinative factors which can be considered without danger of physical waste.

## VII.

### Defenses to Claims for Relief Set Forth in Paragraph X.

(1) Respondents deny that the straight potential basis of allocation is inequitable, arbitrary, and unreasonable, or that it will be equitable only if well spacing is uniform or if potentials of wells are proportional to the recoverable oil in the drainage area of each well. In this connection respondents allege that the present formula is most reasonable to attain the objective of allowing and permitting each well owner in the field to obtain his fair share of oil and gas underlying his property and to attain a like objective of preventing waste and conserving the State's natural resources.

(2) Respondents deny that potentials which are determined by potential contour lines governing the potential ability of wells to produce are fictitious, but allege that the potentials of wells in the East Texas field can be determined with a reasonable degree of accuracy by potential tests on key wells and contouring the results of potential tests of these key wells.

(3) Respondents deny that the disparity between the allowable production between complainant's well and the poorest wells in the field is less than four barrels, but allege that the allowables of the complainant's well are more than ten times as great as the allowable of the poorest wells in the field.



(4) Respondents admit that complainant is permitted to produce 2.32 per cent of the hourly potential of each of its wells and that all other wells are also allowed to produce 2.32 per cent of this potential except for marginal wells, which have a potential of less than 20 barrels per day and which cannot be restricted by law to an allowable less than their potential.

(5) Respondents deny that said proration order under attack bears no relationship to the prevention of physical waste, but allege that the operation of such proration order prevents physical waste.

(6) Respondents deny that complainant must have a daily allowable of 235 barrels allocated to complainant's lease in order to allow it to have an equal opportunity with other owners in the East Texas field to recover that portion of the oil to which it is entitled, but on the contrary alleged that complainant will recover, under the existing order, that portion of the oil in the East Texas field to which it is entitled.

### VIII.

#### Defenses to Claims for Relief Set Forth in Paragraph X-A.

(1) Respondents deny all of the averments of fact contained in subdivision (1) of Paragraph X-A of the Complaint.

49 (2) Respondents deny all of the averments of fact contained in sub-paragraph (2) of Paragraph X-A. of the Complaint.

(3) Respondents admit that all wells are allowed to produce 2.32% of their potential except marginal wells.

which have a potential of not more than 20 barrels per day, and that said marginal wells are generally located on the poorest and worst part of the structure in said field, are less prolific and generally go on the pump first; respondents deny that the marginal wells on the west side of the field have the poorest bottom hole pressure, and say that said wells generally have higher bottom hole pressure. Respondents admit that marginal wells on the east side of the field generally have low bottom hole pressure. Respondents admit that said marginal wells generally have less oil producing sand thickness and are otherwise unfavorably situated. Respondents deny all other allegations contained in subdivision 3 of Paragraph X-A of the complaint.

(4) Respondents say that they do not have knowledge or information sufficient to form a belief as to the truth of the averment that there are thousands and thousands of wells throughout the field more densely spaced than complainant's and that most of said wells are the second to tenth wells on tracts of less than 10 acres owned by one operator on one tract. Respondents deny all other allegations contained in said subparagraph 4 of Paragraph X-A of the Complaint.

(5) Respondents admit that complainant has made application to the Railroad Commission of Texas for an adjustment in allowable, but respondents deny that all of the allegations made in the complaint were made before said Commission and respondents further deny that competent evidence was offered in support thereof sufficient for the Railroad Commission to make an adjustment in allowable for complainant. In connection herewith, respondents aver that complainant did not furnish any competent or sufficient evidence in any of the hearings before the Railroad Commission of Texas to justify said Commission

in adjusting said allowable and that the evidence offered by complainant at said hearings consisted solely of non-expert testimony which was wholly insufficient to warrant any change in the method of proration or in the allowable. Respondents admit that in other oil fields in the State of Texas as well as in the East Texas field, the Railroad Commission of Texas has adopted factors necessary to give producers their share of the oil. Respondents deny all other allegations contained in sub-paragraph (5) of X-A.

(6) Respondents admit the allegations contained in sub-paragraph 6 of paragraph X-A.

## IX.

### Defenses to Claims for Relief Set Forth in Paragraph XI.

(1) Respondents deny that complainant can produce what it contends is its fair portion of the daily oil allowable without causing waste, but on the contrary allege that, if complainant is allowed to produce what it claims is its fair oil allowable and all other operators in similar situations in the East Texas field are allowed to produce with a like allowable, waste will occur which will not occur if all operators adhere to the present system of proration in the East Texas field.

(2) Respondents allege that, if complainant and all others similarly situated are allowed to produce at the rate which complainant contends for, there will be a rapid drop in the bottom hole pressure of the East Texas field, gas will come out of solution and enormous quantities of oil will be left in the reservoir never to be produced, all of which will result in physical waste.

Defenses to Claims for Relief Set Forth in  
Paragraph XII.

(1) Respondents admit that on or about February 24, 1938, complainant filed an application asking an increase in allowable and in the alternative asked that, if it was shown not to be entitled by law to such relief, it be given permits to drill twenty more wells.

(2) Respondents deny, however, that this was necessary in order to give complainant an equal opportunity to recover its fair share of oil, but on the contrary allege that under the present system of allocation complainant will recover its fair share of the oil in the East Texas field.

(3) Respondents admit that a hearing on said application was held March 11, 1939, and that on March 17, 1938, the Commission entered its order denying an increase in allowables and granting the complainant a permit for only one well as a direct offset to the well therefore granted by the Commission to said R. M. Wood.

(4) Respondents deny that its plan of allocation is unfair, inequitable or contrary to complainant's constitutional rights.

(5) Respondents deny that the Railroad Commission of Texas has wholly failed and refused to give any consideration to complainant's rights in the premises, and in this connection, respondents aver that the Railroad Commission of Texas has given a full and fair hearing and proper consideration to complainant's rights.

## XI.

Defenses to Claims for Relief Set Forth in  
Paragraph XIII.

(1) Respondents deny that by maintaining its present order the Railroad Commission has knowingly maintained illegal orders and deny that drainage from complainant's properties has resulted and that complainant has been damaged thereby.

52 (2) Respondents deny that complainant's properties have been drained under the Commission's orders, but allege that complainant has benefited by the operation of the Commission's order in that complainant has drained oil from other property owners in the East Texas field.

(3) Respondents further deny that complainant will lose oil by drainage or migration in the future, and further allege that oil will drain to complainant's property for a long time to come.

## XII.

Defenses to Claims for Relief Set Forth in  
Paragraph XIV.

(1) Respondents say that they are without knowledge or information sufficient to form a belief as to the truth of the averment that complainant fears that it will be sued by its royalty owners for damages and for forfeiture of it lease.

## XIII.

Defenses to Claims for Relief Set Forth in  
Paragraph XV.

(1). Respondents deny the averments contained in Paragraph ~~XV~~ of the Complaint.

## XIV.

Defenses to Claims for Relief Set Forth in  
Paragraph XVI.

(1) Respondents deny all of the averments contained in Paragraph XVI of the Complaint.

Wherefore, it is prayed all relief prayed for by Complainant be in all things denied and that respondents go hence and recover their costs.

GERALD C. MANN,  
Attorney General of Texas,

53

JAMES P. HART,  
Assistant Attorney General of  
Texas,

DURWARD D. MAHON,  
Assistant Attorney General of  
Texas,

State Capitol, Austin, Texas.

HARRY S. POLLARD,  
Attorneys for Respondents.

Consent is given to the filing of the foregoing amended answer this 20th day of January, 1939.

DAN MOODY,  
Attorney for Complainant.

Amended Answer of Respondents. Filed 20th day of January, 1939.



## MEMORANDUM OPINION.

(Title Omitted.)

McMILLAN, Judge:

This case as originally filed was one for three Judges. Complainant, however, abandoned its application for interlocutory relief and the case was, by the agreement of all parties, submitted to one Judge for final determination on its merits.

Complainant sues for an injunction to restrain the enforcement by the Commission of the order of August 29th, 1938, in so far as it affects the production of oil from its mineral lease in the East Texas field. By stipulation of the parties, it was agreed that it would be unnecessary to amend to cover the orders subsequently entered continuing the same plan of proration.

More than the jurisdictional amount is shown to be involved and the order and its method of enforcement and application are attacked as confiscatory. The jurisdiction of the Court appears of record and is in no way challenged by any of the parties.

Article 6029 of the Revised Civil Statutes of Texas directs the Commission generally to make and enforce orders for the conservation of crude petroleum oil to prevent the waste thereof.

Article 6049c, in so far as it is pertinent here, provides:

55        "In the event any such rule, regulation or order which the Commission may adopt provides for the limitation or fixing of the production of crude petroleum oil, or of natural gas from wells producing gas only, in any pool or portion thereof, the Commission shall distribute, prorate, or otherwise apportion or allocate, the allowable production among the various producers on a reasonable basis."

The order of August 29th, 1938, in so far as it applied to the East Texas field, after fixing a top allowable of not to exceed 450,000 barrels a day as desirable, proceeded as follows:

"Rule 23 (a). Therefore, it is further Ordered by the Railroad Commission of Texas that during each twenty-four (24) hour period beginning at 7 o'clock a. m., Central Standard Time, September 1, 1938, the owner or operator or manager of each well in the East Texas Field shall be permitted either collectively or individually, to produce from each well a maximum of Two and Thirty-two Hundredths (2.32%) Per Cent of its hourly potential capacity as determined by the Commission."

By subsequent orders, shutdowns for two days a week have been put in effect. Furthermore, the evidence shows without contradiction, and in fact the parties have stipulated, that the method of application and enforcement of this order by the Commission is very different from the actual wording of the order itself. According to the stipulation which the parties have filed in the case, the Commission's interpretation, application and enforcement of this order is substantially as follows: A top allowable for the days during which the wells were allowed to produce of 522,500 barrels was fixed. Each well in the field that could not produce as much as 20 barrels per day was allowed to make all it could produce.

56 Where the figure of 2.32% of the hourly potential of any well amounted to less than 20 barrels a day, that figure was disregarded and the well was allowed to produce 20 barrels a day. Where the figure of 2.32% would amount to more than 20 barrels per day, the well was allowed to produce on that basis. This application of the order resulted in the following: Approximately 451 wells, not any one of which was capable of producing as much as 20 barrels per day, were allowed

to produce daily a total of approximately 5,250 barrels. Approximately 19,032 wells whose individual hourly potential when multiplied by 2.32% amounted to less than 20 barrels, were each allowed to produce a full 20 barrels per day; or from all of such wells a total of approximately 380,640 barrels per day. These were wells whose hourly potential ranged anywhere from 1 barrel to 860 barrels per hour. Approximately 6,325 wells whose individual potential when multiplied by 2.32% amounted to more than 20 barrels were each allowed to produce daily that number of barrels which equaled the product of its hourly potential multiplied by 2.32%. The total daily production from these wells was approximately 136,610 barrels. These wells had an hourly potential ranging from 865 barrels per hour to about 1,100 barrels per hour. In practical operation, the daily allowable of no well was controlled by the factor 2.32% of its hourly potential unless such well had a potential of 865 barrels or more per hour.

It is manifest that the way in which the Commission interprets, applies and enforces this order is entirely different from the order. Accordingly, the question of the validity of the actual order itself is not controlling, for as said by the Supreme Court in the Greene case, 244 U. S. 507:

"A valid law may be wrongfully administered by officers of the State, and so as to make such administration an illegal burden and exaction upon the individual."

57

See also Southern Realty Corporation v. McCallum, 1 F. Supp. at page 619.

Therefore the matter to be considered here is not the validity of the order as written but as construed and enforced by the Commission.

Complainant, in its brief, makes it clear that it does not attempt to attack the validity of the conservation statutes; that it does not now directly attack the top allowable fixed for the field; and further that it does not attack the spacing rule, generally called Rule 37. The gravamen of its complaint lies in its assertion, forcibly presented, that the Commission does not allocate the allowed production among the various producers "on a reasonable basis". In other words, it says that granting the right of the State to conserve its natural resources, conceding for the present the validity of the Commission's order in fixing the top allowable of the field, the manner in which this allowable has been allocated to the various parties is discriminatory and constitutes a confiscation of complainant's property.

Respondents, on their part, set up generally the characteristics of the East Texas field, the necessity for regulation, proration and so forth. They then assert that owing to the number of wells in the field and the conditions there existing, the present order is practically the only one that can be feasibly worked out. Large amounts of evidence were introduced with regard to the East Texas field generally, covering its characteristics, formations, geology and production problems. Those are matters which have all been gone over and discussed in numerous other cases involving that field and it is not necessary to again set them out here. A brief statement of some of the pertinent facts developed upon the trial, coupled with the

statements which have been heretofore made, will  
58 be sufficient to dispose of this case.

Complainant has a lease of something over twenty-four acres and on this lease it has five wells. All of the wells are producers and, according to the Commission's potentials, they are capable of producing in excess of 865 barrels per hour. Under the order as applied, these wells are allowed to produce a fraction over 22 barrels a day for five days a week. The field is approximately four miles long and has an average width of about four miles. There are

about 26,000 oil wells in the field. Of these, all save approximately 25 are producers. There are some wells which are capable of producing only 6 or 7 barrels a day and some wells that will produce over 25,000 barrels a day. Between those figures there is a wide spread in potentials. Complainant's wells, according to the Commission's figures, will produce on open flow over 20,000 barrels a day. But the actual result of production on open flow, of course, is not known and any such production would in all probability immediately result in a lessening of potentials. However, the figures as computed indicate the relative capacity of the various wells, according to the Commission's notion. Complainant attacks the method of obtaining these potentials but it is unnecessary to pass on that matter to decide this case. It can and should be determined on broader issues. The wells are located upon tracts of various sizes. Constant exceptions to the spacing rules have resulted in great density in drilling. In many instances, there are wells on a fraction of an acre. In complainant's case, there is an average of one well to about five acres. The structure and formation of the field varies. Toward the West, water is encroaching. Toward the East, the producing sand pinches out. There is apparently a well defined drainage in an Easterly direction. Complainant's lease is conceded to be one of the most favorably situated in the field. It is on what is known as the "Fairway". It has one of the thickest of the producing sand formations. It is well located on the structure and is highly desirable from the standpoint of permeability and porosity. It has so far encountered no water trouble. Complainant can produce without difficulty the oil lying under its land with the five wells which it has at this time. It has from time to time complained to the Commission with regard to its allowable without result. On one occasion, conceiving that the present scheme constituted nothing more than a per well basis of allocation, it applied for permit to drill a large number



of additional wells. This application was generally denied, but a permit was given for one additional well, which has not been drilled.

The allowance of 20 barrels per day to all wells capable of making it, plus the amount allowed to those pumping wells incapable of making 20 barrels a day, takes up all of the top allowable of 522,500 barrels with the exception of something slightly over seven thousand barrels a day. Accordingly, the only allowable which remains to be prorated among the higher potential wells upon a potential basis is this negligible amount. Cottingham, p. 67; Hudnall, p. 155.

The respondents' engineers frankly admitted that the present scheme of proration is nothing more or less than one on a per well basis. See testimony of Cottingham, page 67, and Hudnall, page 156. Without regard to their admissions, the uncontradicted evidence manifestly shows that such is the fact. Any well that can make 20 barrels per day is allowed to make it. That portion of the top allowable not taken by the wells which lag below 20 barrels a day is assigned to the more powerful or valuable wells.

60 Complainant's wells, which are admitted to be among the "highest producers in the field, are given under this arrangement the pittance of about 2 barrels a day over other wells which admittedly could not make a fractional part of the production that complainant's wells can make.

The proration of this field on a per well basis has been considered and condemned in a number of cases before this. See *Peoples Petroleum Producers, Inc. v. Smith, et al*, 1 F. Supp. 361; *Peoples Petroleum Producers, Inc. v. Lon A. Smith, et al*, Equity No. 386; Tyler Division, Eastern District of Texas, decided March 17, 1933, unreported; *Rowan & Nichols Oil Company v. Terrell, et al*, Equity No. 479, Tyler Division, Eastern District of Texas, decided March 17, 1933, and unreported. It is unnecessary to restate the reasons given in those cases for con-



demning this method of proration. It is sufficient to say that it takes no account of the difference in the wells, of the richness or thickness of the sand, of the location upon the structure, of the porosity or permeability of the sand, of the estimated oil reserves, or of the acreage upon which the respective wells are situated. The worst property is raised to the level of the best and the best is lowered to the level of the worst.

The disregard of acreage alone should be sufficient to condemn the plan. Here we have a case where a producer with a well to five acres can produce no more than his neighbor who adjoins him with a well on a fraction of an acre. Under the law in Texas, this oil in place belongs to the owner of the land or the leasehold. Any plan which contemplates that any party who can get enough ground to stick a drill bit down and obtain a well is entitled to produce as much as a party who owns ten times as much acreage adjoining him is manifestly wrong. The evidence shows that in a formation like the complainant's lease, one

61 well can sufficiently drain ten acres. Therefore, there is no good reason why there should be fifteen or twenty wells drilled upon such a leasehold.

Yet that is the result if complainant is to compete with a neighbor who drills a well upon a fraction of an acre.

It is manifest that other things being equal, the party with the largest acreage has the most oil. There is nothing in this order however that protects him in that ownership. If a trust fund in which various parties owned different amounts of money was to be distributed, the natural assumption would be that the distribution would be on a prorata basis. If one man had \$100 and another \$1,000, the man with the \$1,000 would get \$10 for every \$1 the other man got. However, suppose for some reason it was determined that either the welfare of the fund or the community dictated that each person should draw \$20 per day from the fund. When the man who had \$100 in the fund had drawn for five days, he would stop. The man

who had \$1,000 would continue to draw his \$20 a day for another forty-five days.

However, under this order, a man who has less oil under his lease than his neighbor does not stop when he gets his part of the oil. He continues to go on at 20 barrels per day as long as he can get any oil either from his own land or drain it from his neighbor's. In the meantime, his better situated neighbor sits by unable to protect himself because of this unequal order.

To these matters the Commission responds that the situation in the East Texas field is difficult and no better order can be prepared. It is, of course, not the duty of the Court to write a better order, nor does the obligation rest upon complainant to suggest one. The fact that regulation is difficult does not justify confiscation. The State interferes with the lawful owner of this oil upon the  
62 theory that it is conserving a natural resource. Its right to do this has been upheld in many cases unnecessary to cite. The idea was hinged originally, and must continue to stand largely, upon the theory of the prevention of waste. The public generally has no title in this oil. If its interest in it is so great that it must needs regulate it to the extent of confiscation, then it approaches the point of expropriation and it must pay for what it does. Obviously this regulation is not proceeding upon any such theory.

Respondents say that if small wells are not allowed to produce sufficiently to make them profitable they will be abandoned and there will be an economic loss. The number of these small wells is, in the opinion of the Court, negligible. Furthermore, the evidence is not at all conclusive that any substantial reserves lying around these wells will be ultimately lost. Moreover, the evidence indicates that the production of these wells with the large amount of water that is brought up with the oil is even more harmful and wasteful to the field than the abandonment of those wells themselves would be. They represent

a small factor in the ultimate recovery of this vast field and should not be allowed to dominate its method of production. Be that as it may, it does not follow that the loss of these small wells would justify the taking without compensation of complainant's property. This order places complainant in position where without ability to fence or fend for itself, it must stand idly by and see its oil drained by wells lying to the East. According to the figures, if nothing happens to complainant's wells and water does not come in from the West, it will take twenty-eight years for it to produce its reserve under the present system of proration. On the basis of these same figures, the field generally will be depleted in about eleven years. It is manifest that the time element is important here. The

63<sup>2</sup> Commission's engineer Cottingham frankly admitted that the present order operates unequally as to complainant, but asserted his opinion that a long period of years would equalize the matter. The question as to whether it will or not is highly problematical. The matter of present-day confiscation is certain. Respondents are not entitled to require complainant to gamble as to what will happen to its oil or its markets over a period of twenty-five or thirty years.

Furthermore, the Court is not of the opinion that the evidence bears the respondents out in the contention that the present order is the only one possible. As said before, it is not the Court's function to draw an order. However, the evidence is not at all clear that this 522,500 barrel top allowable is fixed solely for the prevention of waste. Respondents' engineer Hudnall frankly admitted that he was of the opinion that a higher allowable could be fixed without injury. Their chief engineer, Cottingham, did not deny that such was the case. It is manifest from all of the evidence that the allowable has been fixed, with an eye to the market as well as with an eye to the prevention of waste. Complainant does not attack the idea of a top allowable. That, however, does not preclude the Court

from considering the matter in contemplating the reasonableness of this entire plan of proration. Furthermore, it is evident from the record that it is not necessary to allow all of these wells 20 barrels per producing day in order for them to operate. An allowance of 20 barrels is an arbitrary figure. There was no evidence to show they could not survive on less. In fact the evidence indicates the contrary. There is no reason why many of these wells should not be cut back to a position more nearly approaching their productive capacity and reserve.

64 The difficulty in which the Commission finds itself grows largely out of its relaxation of its own spacing rules. The drilling of thousands of wells, unnecessary so far as the public interest is concerned, has required them to listen to the demands of those well owners at the expense of other operators better situated. No effort has apparently been made to require those parties producing upon too densely drilled acreage to pool their tracts. There is no justification in law for taking complainant's property in order to recoup these parties who drilled these unnecessary wells.

The duty enjoined on the Commission by the Statute is to prevent waste. When in order to do that it has to limit production, then the Statute says it shall allocate the allowable on a reasonable basis. Further than that it is without power to go. It is not its function to repay owners for wells drilled or to guarantee them a return. It can not enrich one man at the expense of another. It is obvious that this order as enforced does not apportion the allowable so far as complainant is concerned on a reasonable basis. If it does, then complainant might as well have had five of the poorest wells as five of the best. It might just as well have bought a one acre lease as twenty-five acres. It might just as well have bought on the edge of the field as the center so long as its wells could make 20 barrels a day. The small surplus allotted on potential amounts to practically nothing and is so admitted by respondents' own engineers.

Respondents, in an effort to extenuate the inequality of their order, suggest the difficulty presented by the marginal well law. Article 6049b, Revised Civil Statutes of 1925. This Act relates to pumping wells and so far as East Texas is concerned forbids the artificial curtailment of production below 20 barrels a day if such reduction would

65      cause damage to the well, or loss of ultimate recovery, or premature abandonment. Their position with regard to this matter is equivocal. There are about four hundred fifty of these pumpers in the field. If, as suggested, the law applies to them, then the order of August 29th, 1938, made no effort to comply with the law for the 2.32% of hourly potentials would never give these wells 20 barrels a day. Their interpretation and enforcement of the order does not do it for the two day a week shutdown cuts a 20 barrel a day allowable to about 14 barrels. All of these pumpers put together do not produce on an average over 5,500 barrels a day. Any one of complainant's wells at half its potential open flow would produce more than that.

Accordingly, it is apparent that the effect of the so-called statutory marginal wells is very slight so far as the general scheme of proration for that field is concerned. The Statute offers no excuse for a flat 20 barrel allowance to other wells running up to 860 barrels per hour.

If it be conceded that the Statute is valid (which has been seriously questioned) and that these strictly marginal wells must be allowed 20 barrels a day if they can make it, still that furnishes no excuse for confiscating the property of some other producer better situated. Pumping wells of this variety might appear in a field to such an extent as to exhaust the entire allowable, thereby leaving nothing for high potential flowing wells. No such absurd result was ever intended. This Statute was obviously designed to keep these small pumpers from being slighted off, it being contemplated that the better wells would have a much higher allowable. If, however, this marginal



minimum must be considered as a component element of a proration scheme, thereby unreasonably reducing the allowables of other better wells, either the Statute or the scheme must fall.

There is no merit in the contention that complainant is estopped to attack this order because of laches. In the first place this order applied and enforced as the  
66 Commission now interprets it is not the same order which existed over the period of years during which the field has been regulated. The continual increase in drilling has operated to make this system of proration progressively more oppressive until the present administration of the order has in effect put the field upon a per well basis. The potential factors of the order have practically become nil. Furthermore the record shows that the complainant has constantly protested to the Commission with regard to enforcement of the order, without result. It has attempted to relieve itself by applying for permits to drill additional wells, how ever unnecessary they might be in the production of its property. Further than that, the matter involved here now is one of confiscation. The orders have been submitted to under the threat of penalties. The right to assert complainant's constitutional rights has not been lost.

The Court is not attempting here to pass upon the order generally or upon the rights of anyone with reference to it save those of complainant. In so far as complainant is concerned, the Court is of the opinion upon the evidence and the law that the order as applied and enforced is confiscatory and void. The complainant has not, however, prayed the Court for a sweeping writ allowing it to produce its wells without restriction. It only asks for what is considers its fair share of the allowable as now fixed for the field. It is the opinion of the Court that it is entitled to such an injunction restraining the respondents from interfering with it in so producing its property. The matter of the character of the decree, including the question as



to the amount to be produced pending appeal or the promulgation of a new order by the Commission, may be settled on notice.

June 12th, 1939.

The Clerk is directed to file this Memorandum Opinion with the papers in the case.

ROBERT J. McMILLAN,  
Judge.

67 Memorandum Opinion. Filed 12th day of June, 1939.

68

# JUDGMENT.

(Title Omitted.)

The above entitled and numbered suit came on for trial at Austin in the Austin Division of the Western District of Texas on February 6, 1939, when came the Complainant Rowan & Nichols Oil Company, by its counsel, and announced ready for trial and also came the Respondents Railroad Commission of Texas, Lon A. Smith, Ernest O. Thompson, Jerry Sadler, and Gerald C. Mann, by their counsel, and announced ready for trial.

Thereupon the Court heard the pleadings and the suit proceeded to trial and was on trial from day to day until February 10, 1939, when, introduction of testimony having been concluded, all parties moved for judgment and the Court heard argument of counsel; upon the completion of counsels' argument, the Court took the suit under advisement and on June 12, 1939, filed his opinion in this suit and announced it to be the opinion of the Court that the

law and the facts were with Complainant; that the proration order of the Railroad Commission of Texas of date August 29, 1938, applicable to the East Texas oil field, as pleaded in Complainant's Bill of Complaint, and the several extensions and renewals of said order, including the order of December 14, 1938, in force at the time of trial, are void as the same have been and are interpreted, applied and enforced by the Railroad Commission of Texas to control production of oil by Complainant from the five wells on Complainant's Todd "B" lease of approximately 25 acres, in the W. H. Castleberry Survey, Gregg County, Texas; and that, Complainant not having sought to produce without restrain oil from its lease or attacked the daily field allowable of 522,000 barrels of oil, but only having sought injunctive relief restraining Respondents from interfering with Complainant in the production of its fair share of such daily field allowable, Complainant is entitled to an injunction restraining Respondents from interfering with Complainant in the daily production of its fair share of the daily field allowable fixed by the Commission for the East Texas field and the other relief herein granted.

It is accordingly ordered, adjudged and decreed by the Court that the order of the Railroad Commission of Texas of August 29, 1938, and the several extensions and renewals thereof, including the order of December 14, 1938, fixing and allocating among wells in the East Texas field the daily allowable for the East Texas field, are void as the same have been and are being interpreted, applied and enforced by Respondents to control production of oil by Complainant from the five wells on Complainant's said lease; that the Respondents, their agents, servants, employees and representatives, be, and they are, each and all, hereby enjoined and restrained from so enforcing or attempting so to enforce said orders, or any of them, against Complainant in the production of oil from said lease, and

from enforcing or attempting to enforce against Complainant in the production of oil from said lease, any such plan of proration or allocation of field allowable among wells as said orders have been interpreted by the Railroad Commission to require; and Respondents, their agents, servants, employees and representatives are restrained from interfering with Complainant in daily producing from the wells

70 on its said lease (except on such days as the entire East Texas oil field may be, by valid order of the Railroad Commission, prohibited from producing) that amount of oil which bears to the daily field allowable fixed by the Railroad Commission the ratio which 220 barrels bears to 522,000 barrels; and Respondents, their agents, servants, employees and representatives, be, and they are, each and all, enjoined and restrained from refusing to issue tenders to Complainant for oil produced from said lease in conformity with this judgment and from otherwise interfering with the transportation and marketing of oil so produced from said lease.

All costs of this suit are taxed against Respondents.

The Clerk is directed to enter this judgment.

To which action, order, and judgment of the Court the respondents in open Court duly excepted.

Entered at Austin, Texas, this the 14th day of June, 1939.

ROBERT J. McMILLAN,  
Judge.

Entered: Eq. Min. Vol. G, page 461.

Judgment Filed 14th day of June, 1939.

## MOTION. TO STAY JUDGMENT.

(Title Omitted.)

To said Honorable Court:

Come now the respondents and move the Court that, as a part of its judgment to be entered in accordance with the memorandum opinion delivered by the Court on the 12th day of June, 1939, the Court grant a stay of its judgment pending the final determination of this cause on appeal, and as grounds for said motion, say:

## I.

Said judgment should be stayed because the effect of the judgment will be to destroy, and not to preserve, the *status quo*. By granting a stay of said judgment, the *status quo* will be preserved until the validity of the proration orders of the Railroad Commission can be finally determined by the Appellate Courts:

## II.

Said judgment should be stayed because a state of great uncertainty and confusion in the East Texas Field generally will be prevented by staying said judgment. No operator in the East Texas Field will know what his rights are until this cause is finally decided on appeal. In the meantime, many operators will feel that they are being  
 72      unfairly treated if the complainant is allowed to produce an amount of oil in excess of the amount allowed under the present proration orders of the Railroad Commission, while the remaining operators in the field are restricted to the amount allowed under the present order. There will almost certainly be a great number of suits by operators desiring to receive the same privileges as complainant, unless by a stay of this judg-

ment the rights of all parties are preserved *in statu quo*. Such lawsuits will only lead to unnecessary expense, uncertainty and confusion. If a stay is refused, there will be no practical way of granting equal treatment to all operators in the field, because there will be no proration method which can be enforced against all of the operators in the field. The Court has not indicated what method of proration would be enforceable, and the Railroad Commission is not free to adopt a different method of proration without forfeiting its right of appeal. Respondents cannot substantially amend said proration orders pending an appeal, for the reason that said appeal would thereby be rendered moot, and respondents would in effect be deprived of their right of appeal.

### III.

Respondents further say that unless a stay is granted by the Court, respondents will in large measure be deprived of their right of appeal and the effectiveness of the judgment of the Appellate Court, in the event the judgment of this Court is reversed and the proration order of the Railroad Commission is upheld, will be to a large extent destroyed.

### IV.

The complainant will not suffer any irreparable injury from a continuation of the present method of proration during the time which will be necessary for the respondents to appeal this case and have the case finally determined by the Circuit Court of Appeals and the  
 73 Supreme Court of the United States. The evidence in this case shows that the present method of proration has been in effect in the East Texas field for over six years, and that it was in effect for over five years prior to the filing of this suit by the complainant. In this

case the complainant did not press its prayer for interlocutory relief and was content to have the case heard about six months after the filing of the suit, on its prayer for a permanent injunction. The evidence in this case shows that the rate of withdrawal of oil from the East Texas Field under the present method of proration is comparatively slow, and negatives the idea that the complainant will suffer any substantial injury during the time that will elapse before the case can finally determined on appeal. In this connection the respondents say that they will give notice of appeal and that they will promptly press their appeal to the Circuit Court of Appeals and to the Supreme Court of the United States in order to obtain a speedy determination of their appeal. Respondents show that they have at no time asked for a continuance or a delay in the termination of this case, and that this prayer for a stay is not asked for any purpose of harrassing or injuring the complainant in any way.

## V.

Any injury which may result to the complainant as a result of the stay of the judgment entered by the Court in this case will be greatly outweighed by the injury which will be done to the respondents and to the operators in the East Texas Field and throughout the State of Texas as a whole as a result of the confusion, uncertainty, and expense which will be caused if the complainant is allowed to produce a greater amount of oil than the remaining operators in the East Texas Field, pending the final determination of this case on appeal.

## VI.

Respondents further say that no bond should be required of respondents as a condition to the granting of a stay of the judgment in this cause, because respondents have



acted purely in their official capacities, in good faith, and without discriminating between complainant and others similarly situated, and it would be unjust to require them to submit to personal liability as a condition of obtaining a stay of the judgment where the appeal can be effective only if a stay is granted.

Wherefore, respondents pray that this Court by its judgment stay the operation of any injunctive relief granted against respondents, pending a final determination of the appeal to be taken by respondents from said judgment, and that no supersedeas bond be required of respondents, and for such other relief as may be proper in the premises.

GERALD C. MANN,

Attorney General of Texas.

JAMES P. HART,

Assistant Attorney General.

D. D. MAHON,

Assistant Attorney General.

HARRY S. POLLARD,

Attorneys for Respondents.

Address: State Capitol, Austin, Texas.

Service of a copy of the foregoing motion was made by me by delivering said copy to Hon. J. B. Robertson at the office of Greenwood, Moody & Robertson, attorneys for complainant, in the Norwood Building, in Austin, Texas, at 11:40 A. M. on this 13th day of June, 1939.

JAMES P. HART,

Attorney for Respondents.

Motion To Stay Judgment Original. Filed 13th day of June, 1939.

## ORDER OVERRULING MOTION FOR STAY OF JUDGMENT.

75

(Title Omitted.)

On this the 14th day of June, 1939, came on to be heard the motion of Respondents for a stay of judgment in this suit pending appeal, and the Court having heard and considered the same is of opinion that it should be overruled, and accordingly Respondents' motion for stay of judgment pending appeal is in all things overruled and denied.

ROBERT J. McMILLAN,

Judge United States District  
Court, Western District of  
Texas.

Entered: Eq. Min. Vol. G, page 463.

Order Overruling Motion For Stay Of Judgment. Filed  
14th day of June, 1939.

76

## NOTICE OF APPEAL.

No. 624 In Equity.

In the District Court of the United States For the Western  
District of Texas, Austin Division.

Rowan & Nichols Oil Company, Complainant,

vs.

Railroad Commission of Texas, Lon A. Smith, Ernest O.  
Thompson, Jerry Sadler, and Gerald C. Mann, Re-  
spondents.

Notice is hereby given that the Railroad Commission of Texas and Lon A. Smith, Ernest O. Thompson and Jerry Sadler, Members of the Railroad Commission of Texas, and Gerald C. Mann, Attorney General of Texas, respondents above named, hereby appeal to the United States Circuit Court of Appeals for the Fifth Circuit from the

final judgment entered in this action on the 14th day of June, 1939.

Dated this 19th day of June, 1939.

(Sgd.) GERALD C. MANN,  
Attorney General of Texas.

(Sgd.) JAMES P. HART,  
Assistant Attorney General.

(Sgd.) D. D. MAHON,  
Assistant Attorney General.

(Sgd.) HARRY S. POLLARD,  
Attorneys for Respondents.

Address: State Capitol, Austin, Texas,

77 Notice Of Appeal Original. Filed 19th day of June, 1939.

78

# APPEAL BOND.

(Title Omitted.)

Know all men by these presents that we, the Railroad Commission of Texas, acting herein by and through Lon A. Smith, Chairman of the Railroad Commission of Texas, who is hereunto duly authorized, and Lon A. Smith, Ernest Q. Thompson, and Jerry Sadler, Members of the Railroad Commission of Texas, and Gerald C. Mann, Attorney General of Texas, as principals, and American Surety Company of New York, a corporation, of New York, duly authorized to become surety upon judicial bonds, as surety, are held and firmly bound unto Rowan & Nichois Oil Company, the above named complainant, its successors and assigns, in the penal sum of Two Hundred and Fifty Dollars (\$250.00) to be paid by the said Railroad Commission of Texas, Lon A. Smith, Ernest O. Thompson, Jerry Sadler, and Gerald C. Mann, for the payment of which well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

The condition of the foregoing obligation is such that,

79       Whereas, the above bounden Railroad Commission of Texas, and Lon A. Smith, Ernest O. Thompson, Jerry Sadler, and Gerald C. Mann, have given notice of appeal to the United States Circuit Court of Appeals for the Fifth Circuit from the final judgment entered in the above entitled and numbered cause by the District Court of the United States for the Western District of Texas, Austin Division, on the 14th day of June, 1939;

Now, Therefore, if said Railroad Commission of Texas, and said Lon A. Smith, Ernest O. Thompson, and Jerry Sadler, and Gerald C. Mann, shall prosecute said appeal to final effect and shall pay all costs if they fail to make their plea good or if their appeal is dismissed or said judgment affirmed or such costs as the Appellate Court may award if said judgment is modified, then this obligation shall be void, otherwise to remain in full force and effect.

Dated this 19th day of June, 1939.

RAILROAD COMMISSION OF  
TEXAS,

By LON A. SMITH,  
Chairman.

(Sgd.) LON A. SMITH,  
(Sgd.) ERNEST O. THOMPSON,  
(Sgd.) JERRY SADLER,  
(Sgd.) GERALD C. MANN,

Principals.

AMERICAN SURETY COM-  
PANY OF NEW YORK,

Security.

By W. T. DECHERD,  
Resident Vice President.

(Seal)  
Attest:

S. C. LINSOMB,  
Resident Assistant Secretary.

Appeal Bond Original. Filed 19th of June, 1939.

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## CLERK'S CERTIFICATE.

The United States of America,  
Western District of Texas, ss.

I, MAXEY HART, Clerk of the United States District Court in and for the Western District of Texas, do hereby certify that the foregoing on 79 pages is a true and correct transcript of a portion of the proceedings had and orders entered, as therein stated, in Cause No. 624 In Equity, styled Rowan & Nichols Oil Company versus Railroad Commission of Texas, et al, as the same appear on file and of record in this office.

I further certify that said transcript embraces only such pleadings, process and orders as are specified in the praecipe filed herein by Appellants.

Witness my official signature and the seal of said District Court, at office in the City of Austin, Texas, this the 20th day of June, A. D. 1939.

MAXEY HART,

(Seal)

Clerk of said Court.

By JOE STEINER,

Deputy.

## STATEMENT OF EVIDENCE.

(Question &amp; Answer Form)

5

(Title Omitted.)

Be It Remembered, that the Complainant above named came into the District Court of the United States for the Western District of Texas, Austin Division, and sued the Respondent above named, and the Respondent appeared and filed answer; and thereupon issues were joined between them; and afterward, to-wit, at a session of said Court held in the City of Austin, before the Hon. Robert J. McMillan, Judge of said United States District Court for the Western District of Texas, on the 6th day of February, A. D. 1939, the issues between the said parties came on to be heard. Complainant being represented by Rice M. Tilley, Esquire, Hon. Dan Moody and Phillip Tocker, Esquire; and Respondent being represented by Hon. James P. Hart and Hon. D. D. Mahon, Assistants to the Attorney General of Texas, and Harry Pollard, Esquire.

Whereupon, during the course of the trial the following evidence was adduced and proceedings had, Viz:

6

A. H. ROWAN, called as a witness on behalf of the Complainant, having been first duly sworn, testified as follows, to-wit:

## Direct Examination.

Questions by Mr. Tilley:

Q.. Your name is A. H. Rowan, and you reside in Fort Worth, Texas?

A. Yes, sir.



Q. And you are an officer of the Rowan & Nichols Oil Company a corporation?

A. Yes, sir.

Q. What is your office?

A. President.

Q. Mr. Rowan, does your company own any production in the East Texas field?

A. Yes, sir.

Q. Where?

A. Two leases on the B. C. Todd, Castleberry Survey, W. H. Castleberry Survey, in Gregg County.

Q. How much acreage do you have in the B Lease?

A. Twenty-five.

Q. How many wells?

A. Five wells.

Q. Did you drill those wells in accordance with the spacing rules and regulations of the Railroad Commission?

A. Yes, sir.

Q. From time to time?

A. Yes, sir.

Q. You have a statement there as to the dates on which those wells were completed?

A. Yes, sir.

Q. Will you hand that to me and let us have it identified as an exhibit?

A. Yes, sir.

Q. Did you drill those wells at such times and such locations as you thought would reasonably protect your property?

A. Yes, sir.

Q. Are they enumerated in here, the dates of beginning and completion?

A. Yes, sir.

Q. Did you also enumerate in here the amount of production from those wells?

A. Yes, sir, it is enumerated by years, and then the total cumulative production as of January 1, 1939.

Q. And what is the average per acre?

A. I think the average is around fourteen thousand per acre.

Q. Mr. Rowan, how long have you been in the oil business?

A. For myself since January 1, 1924.

Q. What kind of business have you been engaged in in connection with the oil business?

A. I have two compaines. One is a drilling contracting company where I drill wells for others on contract; and I have production in this oil company.

Q. Do you in your drilling business go out on the wells and supervise them?

A. Yes, sir.

Q. You are a drilling contractor yourself by trade?

A. Yes, sir.

Q. You have your own production, I believe you stated?

A. Yes, sir.

Q. What fields have you drilled wells in generally throughout the State?

A. Yes, sir, we have drilled wells in the Gulf Coast and Southwest Texas along what is known as the Fault Line fields and Corsicana. Mexia, the Permian Basin and New Mexico and East Texas and wildcat territories throughout the State.

Q. How many wells did you drill, approximately, in East Texas?

A. I don't know the exact number, but I think over a hundred.

Q. Did you ever examine the cores in those wells, or some of those cores?

A. Yes, sir, I have examined the cores from numerous wells.

Q. Do you know how to analyse a core as an oil man would?

A. You mean make a laboratory test?

Q. I mean to determine if it is an oil sand core, to determine within a reasonable degree its permeability or porosity?

A. I think my experience looking at cores and observing the action of the well after it has been brought in gives me a fairly good knowledge of what to expect after looking at the core, yes, sir.

Q. Do you personally supervise the drilling of those wells in East Texas?

A. Yes, sir.

Q. Now, with reference to your production experience, have you yourself participated in or supervised the operations of the production of the oil of any tracts in the East Texas field?

A. I have on both those tracts that we have production on from the time we got our first oil.

Q. Did you ever personally ever supervise any potentials taken on any of those wells over there?

A. Yes, sir.

Q. Now, Mr. Rowan, do you read a lot about drilling, about the drilling of oil wells and production practices?

A. Yes, sir, I read as much as I have time to read and what I can get my hands on.

Q. Have you attended to any marked extent proration hearings before the Railroad Commission at which the problems of the East Texas field were discussed, engineering problems and underground conditions, and those things?

A. Yes, sir, on numerous occasions.

Q. Are you fairly familiar with those problems?

A. I think I am, yes, sir.

Q. Are you on any committees of the American Petroleum Institute, or have you been on any of them for the purpose of studying those problems of drilling and production?

A. No, I never have been on any committees like that that I remember of.

Q. Or any other associations?

A. I am a member of the American Petroleum Institute.

Q. You have been on committees, but not for that purpose?

A. I have appeared before committees and entered discussions, but I don't remember ever being a committee member.

Q. Have you had occasion to talk to numerous engineers and geologists who have made a minute study of the problems of the East Texas field?

A. On numerous occasions.

Q. Do you feel your experience and knowledge qualifies you to some extent to determine within a reasonable degree of accuracy the conditions in the East Texas field such as sand thicknesses and to interpret bottom hole pressure and potential as the same is taken or might otherwise be taken?

A. Yes, sir, I think I do.

Q. The permeability and porosity?

A. I wouldn't say I would make a permeability or porosity test, I wouldn't say I could unless I had the laboratory, a laboratory equipped to do it. I can look at a core and tell you my idea of its permeability or porosity.

Q. It wouldn't be as accurate as a laboratory test?

A. No, sir.

Q. Have you analysed cores and later seen a laboratory test of those cores and marked any degree or lack of degree of accuracy between the two?

A. As far as permeability is concerned?

Q. Yes, or porosity?

A. No, sir, I don't believe I have ever made these comparisons in my own mind, Mr. Tilley, as to what estimate I would place on it and what would be placed on it by the laboratory.

Q. I believe you stated you could tell within a reasonable degree the permeability or porosity by examining the core?

11 A. I think I can look at a sand and tell whether it is tight or loose, and that is what permeability is.

Q. What would you say the variation is between the poorest potential in the East Texas field and the best, under open flow conditions?

A. Well, you mean now?

Q. Now.

A. There is wells in the field that, I guess, won't pump over five or six barrels a day, and I believe there are wells in the field right now that will make between twenty and twenty-five thousand barrels of oil a day on short tests, such as was taken to establish the potential contours.

Q. All right, how much would you say your well would produce today under open flow production?

A. My guess would be somewhere in the neighborhood of nine hundred barrels per hour.

Q. I asked you open flow?

A. Open flow, yes, sir, that is, I am making my estimate now based on the method that was used by the Railroad Commission in establishing those contour lines, using that same method.

Q. If you should let your well run wide open today, what do you estimate would be the twenty-four hour yield of that well?

A. I don't know.

Q. Can you estimate it?

A. You mean let it flow for twenty-four hours?

Q. Yes, sir.

A. Well, the only estimate I can make on it is the performance that we observed at the time that we took the potential test on it.

12 Q. Yes.

A. And my recollection is that was a three hour test. My recollection is that the third hour was practically the same as the first or the second hour test, that there was not any dropping off. Consequently, I would say, in the absence of any other information to the contrary, that the well might keep on flowing that way for twenty-four hours.

Q. Well, now, what would that be, the approximate amount of oil per day that would produce, per day, open flow?

A. That would be a little over twenty thousand barrels.

Q. Now, is that among the best wells in the field, where your wells are?

A. Yes, sir, it ranges right up to the top. There are wells that have shown a higher potential than that well.

Q. Well, how many wells are there in the field all together?

A. According to the schedules that the Railroad Commission published on January 1st, there were about 25,900.

Q. How many wells would you say there are over there that would top your potential, open flow potential, per day?

A. I have a computation. There are about five hundred wells.

Q. About five hundred wells out of almost twenty-six thousand?

A. That is right, yes, sir, that are accorded a slightly higher allowable than mine.

Q. Does that mean they could produce more than yours?

A. I don't think so, Mr. Tilley. I think if my well was drilled into the sand as far as some of those wells were that were tested, and if it was tested under the same circumstances as these other wells, I think my well would produce as much oil on potential as any well in the field.



Q. All right, let's get back to the time that the potential map was promulgated by the Commission. Now, that map has not been corrected, I believe, by new potentials being taken?

A. I think there has been some correction made from time to time.

Q. But new potentials have not been taken over the field?

A. Not over the entire field.

Q. Now, Mr. Rowan, what was the—what do you estimate—

A. There have been a few wells tested.

Q. What do you estimate to have been the daily potential open flow of your well at the time this potential map was promulgated?

A. You mean if all the conditions were the ideal conditions, if I drilled it into the sand as deep as I could drill it in there, drilled clear through the sand and had no back pressure on top of the well head?

Q. That is right.

A. I think the well probably would produce eleven hundred barrels.

Q. An hour?

A. Yes, sir.

Q. Multiply that by twenty-four and you would have approximately what?

A. That would be 26,400 barrels per day.

Q. Now, do you think at that time that that was probably the best or about the best well in the field?

14 A. Using seven inch casing, yes, sir. There are wells in the field with bigger casing that have made higher potentials than that due to the fact that they had larger casing, but with a seven inch casing that is about as big as I know anything about.

Q. Now, Mr. Rowan, a test was made on your property, was it not?

A. Yes, sir.

Q. On what well on what lease?

A. It was made on A Lease, Well No. 3, as well as I remember.

Q. Mr. Gordon Griffin, was he there at the time.

A. He was the resident engineer for the Railroad Commission at Kilgore, and observed the test.

Q. He is in the Courtroom now?

A. Yes, sir.

Q. He was with you when you took that potential, and supervised it?

A. Yes, sir.

Q. What did that potential show?

A. On a three hour test it showed the average of the last two hours to be 964 barrels per hour.

Q. Could you have so equipped that well and your tanks and flow lines as to have exceeded that?

A. No, I don't think so, Mr. Tilley.

Q. Well, did you have any back pressure on the well?

A. Yes, sir, had about thirty pounds.

Q. Explain to the Judge what back pressure is, what you mean by back pressure?

A. It is the pressure on top of the Christmas tree of the well that is retarding the flow or retarding the oil, to keep it from getting away from the well head.

Q. How did you flow that well?

A. I flowed it through two four inch lines out of the casing head, and I believe there was one four inch line out of the tubing head.

Q. Did those four inch lines constitute a back pressure factor?

A. Yes, sir, they constituted some back pressure factor.

Q. Where was your tank situated?

A. The tank was situated pretty close to the well, about as close as we could get it to the well without having it right up against the well.

Q. Was it below or above the level of the head of the well?

A. Above it.

Q. How much.

A. The top of the tank was about, and we were flowing one line into about the middle of the tank, and the other two to the top, about twenty-two feet—about sixteen feet.

Q. Could an engineer make a calculation to make an adjustment for that back pressure to give you a higher allowable?

A. I think so.

Q. Did the Commission do it?

A. No.

Q. Now, were there other wells—there were potentials of other wells taken throughout the field?

A. Yes, sir.

Q. Were some of those potentials made into tanks which were below the head of the well?

A. That is correct.

16 Q. What does that demonstrate?

A. Those wells had a higher potential and they had a lower back pressure on the well. Some of those wells had as low as ten pounds back pressure.

Q. Now, that gave that well, then, an advantage over your well?

A. It gave it an advantage, yes, sir, in setting the allowable.

Q. Was that real?

A. I don't think so, no, sir.

Q. I mean was it substantial?

A. The test showed it had more, but I don't think it meant that well would produce, that particular well would produce any more oil than mine.

Q. Did the Commission make any adjustment for that situation?

A. No, sir.

Q. What happened when you took this open flow test there for a three hour period, and what time of the morning did you take it?

A. Started flowing the well about 7:00 o'clock in the morning, and we had taken these connections and turned them into the tank, a thousand barrel tank which was sitting by the side of the well. Manhole or vent on top of the tank was taken off and the oil was permitted to flow into that tank without going through the separator, and the gas came out at the top of the tank and there was a gentle breeze blowing from the south, and that gas went up a valley like a smoke for at least half a mile, and possibly farther. It was a very wet gas, of

17 course, and we sent men out in cars to warn everybody in the houses to put out their lights and fires and to try to stop all automobiles and anything of that nature from getting into this valley where this wet gas was hanging, so as to prevent a fire, because if that gas had become ignited at any point, even half a mile from the well, that flame would have followed the gas on up the valley and ignited the tank, and the well being flown, it would have been practically impossible to shut the flow down.

Q. Did you place in jeopardy the lives of your men by taking that test?

A. I kept them away from the well during the time that it was flowing, and the only time that I let them go on the tank was when we had to gauge it to get the hourly rate, and then, of course, we had to go to close it, and if a fire had occurred at any one of those times, why, lives of course would have been lost.

Q. Is it very dangerous to take such a test as that?

A. Yes, sir, I think it is the most dangerous thing I ever saw done in an oil field.

Q. Did Mr. Griffin tell you he thought so also?

A. Yes, sir.

Q. Now, Mr. Rowan, let's come to your test. Before I get off of that, what is the daily allowable at the present time fixed by the Railroad Commission?

A. The total?

Q. Yes.

A. Slightly over 522,000 barrels.

Q. And you produce how many days a week?

18 A. Five days a week.

Q. What is the actual daily allowable for the producing days?

A. I think it is around 373,000 barrels on a seven day average.

Q. Now, Mr. Rowan, I believe you stated that your well, for instance, would produce 22,000 barrels a day. What is your allowable for those wells, per well?

A. The allowable per well?

Q. Yes, sir.

A. Slightly over twenty-two barrels.

Q. Per day?

A. Yes, sir.

Q. Now, what does the poorest well in the field get, if it can make twenty barrels?

A. It gets twenty barrels.

Q. What would a well on 1/100th of an acre—and, by the way, are there wells over there on as little as 5 100ths of an acre?

A. That is a half acre?

Q. No. That is one twentieth of an acre.

A. Yes, sir.

Q. Are there numerous such wells?

A. Yes, sir.

Q. Now, does one of those wells on a twentieth of an acre, situated favorably on the structure—situated on the poorest part of the structure—get practically the same allowable as you?

A. Yes, sir, if his well will make twenty barrels, he does.

Q. If it will make twenty barrels?

19 A. Yes, sir.

Q. Now, tell the Court about the Wood well which is right next to you?

A. The R. M. Wood well is situated just to the south of my No. 1 well. It is located on a strip of ground which they claim is an acre. My engineer claims it is one tenth of an acre.

Q. All right. Now, under the present allowable order what is your average per acre allowable per day—what is that?

A. Average per acre 4.48 barrels per acre.

Q. About four and a half barrels per acre?

A. Yes, sir.

Q. All right, now, how much is Mr. Wood getting per acre, right next to you?

A. He is getting about 220, (a little over 220 barrels per acre per day.

Q. It averages four and a half for you to 250 an acre for him?

A. 220.

Q. Now, are the sand conditions the same under your lease as under his?

A. Yes, sir.

Q. Is that right?

A. Yes, sir.

Q. They give him the same potential that they give you?

A. Yes, sir. That estimate on 220 barrels per day per acre is assuming, of course, his acreage to be one tenth, which my engineer says it is.

Q. Now, if the Railroad Commission says that the potentials represent in any reasonable degree recoverable oil under a lease over there, have they given any consideration to it in the Wood case?

20

A. No, sir.



Q. Have they given any consideration to it on any other small tract that you know of?

A. No, sir.

Q. Now, you say that you are familiar with the East Texas field generally?

A. Yes, sir, I think I am. I have drilled wells all over there.

Q. Now, what do they call the Fairway over there?

A. The Fairway is an expression that is used by oil men which denotes the approximate one-third center of the field, running north and south.

Q. Well, before we get to that, Mr. Rowan, have you examined the potential map that we are talking about?

A. I have seen a Railroad Commission potential map, yes, sir.

Q. That map gives you a potential of 960 barrels a day, I believe you stated?

A. 964 on some wells; 960 on others; 970 on some.

Q. That is per hour?

A. Yes, sir.

Q. Now, your allowable is based on that, of course?

A. Yes, sir.

Q. And that is twenty-two plus per day, you stated?

A. Yes, sir, twenty-two barrels and a fraction barrels.

Q. What did the Commission do when they got over to the east side, did they take potentials over there?

A. There is large areas in there they didn't  
 21 take any potentials at all, they just took a potential on a well maybe a mile or a mile and a half from the eastern limits of the field and then drew imaginary contour lines in from that well. For instance, if they had a well on the east side that would make 600 barrels they just equally spaced their contour lines from there to the eastern limits of the field and drew them in at hundred foot contours.

Q. When did they start the 600 potential contour lines?

A. They would start that—any line they made would have to start at a point where they took a potential on a well.

Q. Well, I meant 600 hundred barrels instead of 600 feet.

Mr. Moody:

He meant hundred barrel contour lines.

Q. You meant that?

A. Yes, sir.

Q. Are you familiar with the area over there where the 600 barrel contour begins and goes over until it feathers out on the eastern side?

A. I am from observing the Railroad Commission map, yes, sir, from observing the Railroad Commission contour map.

Q. Those wells are given twenty barrels, if they will make it, pumping or flowing?

A. Yes, sir.

Q. All right, how does your ability to produce compare with that of those wells?

A. Well, a pumping well on the east side, it wouldn't make but twenty-one barrels a day, one that wouldn't make but that would be given twenty barrels, as  
22 opposed to my well which has a Railroad Commission acknowledgment, an acknowledged potential of 964 barrels, and it is only given slightly over twenty-two barrels.

Q. Those wells which are given a potential from 600 to 200 barrels per hour, will they actually produce that?

A. A great many won't and never would, wouldn't at the time the map was made.

Q. Now, let's get back to the Fairway or position on the structure—what do you mean by position on the structure?

A. Position on the structure, as the term is used by oil men, usually means the highest part of the structure or the most favorable part of the structure with reference to sand thickness.

Q. Now, describe the East Texas field in reference to sand conditions, the water table, and how the sand feathers out on the eastern side, just describe the field to the Court generally?

A. It is a shoreline field, the sand is laid down up against what is known as the Sabine Uplift. Its thickness on the eastern edge is from nothing, I would say, and gradually becomes thicker as it goes to the west or towards the Woodbine Basin west of the eastern limits of the field. The western part of the field is underlain with water. The eastern part doesn't have any water under it. The thickest saturated sand section of the field is down through the middle of the field.

Q. Now, is gas free or in solution over there.

A. My understanding is it is in solution.

23 Q. All right. Now, what is the lifting energy over there?

A. The lifting energy is the water drive.

Q. Does the gas in solution have anything to do with that?

A. I think it helps, yes, sir.

Q. How?

A. Well, as the oil is raised up in the hole the expansion of gas helps to lift the fluid from a certain portion in the hole out to the surface.

Q. Is your lease on or off the Fairway.

A. My lease is on the Fairway.

Q. How many acres of leases over there embrace what is commonly referred to as the Fairway?

A. Well, my estimate on it would be about a third of the acreage would be in the Fairway.

Q. You mean a third of the acre feet of sand?

A. I don't understand your question.

Q. When you say a third are you referring to acre feet of sand or referring to your surface?

A. On the leases?

Q. Yes.

A. A third of the leases. That is not in total number of leases, but a third of the total acres of the field.

Q. Surface acreage?

A. Surface acreage in the field, is what I would term the Fairway.

Q. Now, where are you situated with reference to the Fairway?

A. I am in the Fairway.

Q. Right in the middle of it?

A. I wouldn't say exactly in the middle, but  
24 I am in the—it depends on where you place that fine line of demarkation.

Q. Is that where the sand is thickest or not thickest?

A. The sand is thickest in the Fairway.

Q. Describe to the Court what advantage; or whether or not there is any advantage with reference to being on the Fairway?

A. The advantage is in that you have the thickest sand, and by virtue of having the thickest sand you should have more recoverable oil. You have more recoverable oil in place under those tracts that are in the Fairway.

Q. Now, under open flow conditions, Mr. Rowan, would the Fairway have any advantage over the east or west side of the field?

A. Yes, sir, it would have a very decided advantage.

Q. Why?

A. Because the recovery would be greatest and the flowing life would be long after the west side had been drowned out by the water and the east side had been put on the pump.

Q. Now, how do the bottom hole pressures on the Fairway compare with those on the east side?

A. Right now?

Q. Right now?

A. The bottom hole pressures are the smallest on the east side and highest on the west side. That is due to the water energy coming from the west.

Q. Now, Mr. Rowan—

A. In the middle of the field you are in a comparable position.

Q. Now, Mr. Rowan, under proration what advantage, if any, will the east have on the Fairway or the Fairway have over the eastern side of the field?

25 A. Ask that question again, Mr. Tilley.

Q. Under the present plan of proration, or under any plan of proration—

Mr. Tilley:

I withdraw that question.

Q. Under a per well plan of proration what advantage, if any, would the east side of the field have over the Fairway, or visa versa?

A. It will have a very decided advantage over the Fairway.

Q. That is under a per well plan?

A. That is under a per well plan, yes, sir.

Q. Why?

A. Well, it will get many times more oil than was originally under that portion of the structure.

Q. Why?

A. Because on equal withdrawals the oil is migrating from the west to the east, and most of your oil is in place under the middle of the structure. Consequently, if you are drawing it out on a per well basis, and assuming that the field is drilled up to a uniform pattern, the man in the middle of the field would lose his oil because it would migrate, up-dip to the east.

Q. In other words, if somebody would take you hunting and drive deer by you, but hold your gun, it wouldn't do any good?

A. No, sir.

Q. Is that it?

A. Yes, sir.

26 (At this time a recess was taken, at the conclusion of which the following proceedings were had.)

Q. Now, Mr. Rowan, you, of course, are familiar with the area generally around your leases?

A. Yes, sir.

Q. I will ask you whether or not, just arbitrarily taking an area eight times the size of your lease, as to whether or not that area is the same or practically the same or is not practically the same density as your lease?

A. I think so, yes, sir.

Q. Now, the fact that that density does exist, does that in any way affect the amount of oil that is either under or that will be ultimately recovered from your tract, if outside of that area there is a more greatly and densely drilled area?

A. I think it doesn't indicate how much oil I have under my tract, but I think it affects the recovery from my tract by virtue that there might be—I might have the same drilling density within an area eight times, and within an area nine times or ten times, it might be drilled at a lot denser than that, and I would loose some oil.

Q. The East Texas field is a common reservoir, is it not?

A. Yes, sir.

Q. Well, if there were very densely areas just outside this eight times area of your lease, would that densely drilled area, being prorated on the present plan, would



that tend to deprive you of getting your fair share of the oil, the oil estimated to be under your land, or the equivalent thereof?

27 A. Yes, sir, it would.

Q. Now, Mr. Rowan, have you and your engineers estimated what the per acre recovery is over there under your tract?

A. Yes, sir.

Q. What is it?

A. Originally or now?

Q. Both?

A. Originally it was slightly over 60,000 barrels per acre. At the present time it is about 46,000 barrels per acre on the B Lease.

Q. You mean that was the amount of oil under your land at that time and under your land now?

A. That is correct.

Q. We are not talking about what can be recovered under the present plan, we are talking about what is under there now?

A. That is correct.

Q. That is what your figures testify to?

A. Yes, sir.

Q. How does that compare with the rest of the East Texas field?

A. On a percentage basis?

Q. No, sir; with reference to whether or not it is good or poor or the best in the field, or what?

A. Well, it is considerably better than the average.

Q. Considerably better?

A. Yes, sir, considerably better than the average.

Q. Now, have you estimated the recoverable oil under the entire East Texas field?

A. Yes, sir.

28 Q. Have you prepared a schedule to show—that is, have you made an investigation and determined what that is, how much recoverable oil there is in the East Texas field at the present time?

A. Our computations show that there is left in the reservoir at this time 2,217,980,000.

Q. Do you have an extra copy of that for the Court?

A. Yes, sir (passing paper to the Court).

Mr. Hart:

May I see that if you are going to introduce it in evidence?

Mr. Tilley:

You can see it, Mr. Hart; but it is just a memorandum he prepared after this computation.

Mr. Hart:

Do you have a copy of it?

Mr. Tilley:

No.

The Witness:

Here is a copy (handing same to counsel).

Q. Now, how much do you estimate you now have, barrels in place under your lease?

A. At the present time 1,151,168.

Q. What is your present daily allowable under the present plan of production?

A. 111.83 barrels.

Q. Now, if you would produce under the present plan, Mr. Rowan, how many days would it take you to recover that oil?

A. It would take me 10,278 days.

Q. I noted the tabulation shows 10,278?

A. It should be 10,278 days.

Q. Now, how many years at 365 days each, producing days, would it take to produce that oil?

A. 28.1.

Q. How many five days a week?

A. 39.3.

Q. Now, you said a while ago, I believe, that the total recoverable oil was 2,217,980,000?

A. Yes, sir, correct.

Q. What is the number of days it would take to recover all of the oil under the present allowable?

A. 4,240 days.

Q. Now, at 365 days a year?

A. It would take 11.35 years.

Q. All right, then, while the field would only take eleven years to be depleted, in order to get your oil your figures show it would have to produce twenty-eight years, or more than twice as long?

A. Yes.

Q. Two and one-half times as long?

A. Yes, sir, that is correct.

Q. In other words, when the field is depleted, you still haven't got near your oil?

A. That is correct.

Q. Now, at five days a week, 261 producing days, how long would it take to get all of the producing oil?

A. 16.26 years.

Q. For the field?

A. Yes, sir.

Q. Now, compare that with the number of 30 years it would take you to get your oil?

A. It would take 39.3 years, producing only five days a week, using the present rate of flow and allowable, to my lease to get me the equivalent of my estimated recoverable reserves out.

Q. I believe you have given the figure of the ultimate recovery of the field?

A. Yes, sir.

Q. And the production to date has been how much, and what percentage?

A. We estimated the total recoverable oil in the reservoir originally as 3,522,710,352 barrels, which is a hundred per cent. The production to January 1st, 1939, is 1,304,730,000, or 37.04 per cent of the total recoverable has been taken out of the reservoir to date.

Q. Now, Mr. Rowan, do you have an analysis there which is handy to show—well, I believe you show it there, subsequently, don't you? Just explain the rest of the figures with reference to the ultimate recovery of your lease and production of your lease in percentages?

A. We estimate the ultimate recovery of our lease originally as 1,506,422 barrels. Our production to January 1st, 1939, has been 355,254 barrels, or 23.58 per cent.

Q. All right. Now, have you suffered in reference to percentages there as compared with the rest of the field?

A. I have lost about fourteen per cent.

Q. In other words, the rest of the field has produced thirty-seven per cent, whereas, you have only  
31 produced only twenty-three per cent plus?

A. That is correct.

Q. What is the average Woodbine section over there in the field?

A. We compute it at forty-two feet.

Q. Have you computed the net sand?

A. About twenty-eight feet.

Q. Now, what is the Woodbine section there?

A. The Woodbine sand section on our lease is ninety-five feet.

Q. All right, what is the net sand under your lease?

A. Sixty-five feet.

The Court:

What do you mean by the net sand?

The Witness:

That is the clean—that is the saturated sand, taking out the shale and ash and taking out the impervious particles that are in the sand.

Q. Now, you have prepared a formula there, Mr. Rowan. Will you explain that to the Court?

A. This formula takes into consideration the—it wasn't prepared by me; it was prepared by my engineer—it takes into consideration the necessary factors such as percentages of recoverable oil and the porosity and water in the oil, and one thing and another. It shows a net of 927 barrels per acre.

The Court:

This copy I have here has a pencil mark on it 885. Which is right.

The Witness:

927.

Q. You mean per acre foot, Mr. Rowan?

A. Per acre foot, yes, sir.

32 Q. Now, do you remember off-hand what the per acre foot is for the whole Woodbine section?

A. We use the same basis of recovery per acre foot on the whole field as we did on our lease, notwithstanding that we think our lease has a character of sand that is as fine as there is in the whole field, on a basis of its yield.

Q. How did the Todd reserve then compare with the total of the field, in what percentage?

A. The percentage .004276.

Q. On those figures, then, what has been your loss to date?

A. Had we taken a percentage of .004276 times the production to date, which was 1,304,730,000 barrels, we would have produced 202,648 barrels more than we actually produced under the allowable as set by the Railroad Commission.

Q. Now, Mr. Rowan, have you been before the Railroad Commission before to try to get them to give you what you say your fair share of the oil is?

A. Yes, sir, pretty nearly every year for the last seven years.

Q. How long, for about seven years?

A. Yes, sir.

Q. Is this anything new as between you and the Commission?

A. No, sir; I have asked them on numerous occasions to make an adjustment.

Q. You have gone before the Commission and testified for over six years?

A. Yes, sir.

Q. Now, have you been to Court over the matter?

A. Yes, sir, this is the third law suit I have  
33 filed.

Q. You tried one case in Houston in which the order was declared invalid?

A. Yes, sir.

Q. And another in Fort Worth in which a temporary injunction was denied?

A. Yes, sir.

Q. That injunction was denied—what was the relative comparison between the allowable for the best well and the twenty barrel wells?

A. Well, I think at that time, Mr. Tilley, there was a minimum allowance of forty barrels per well, and I don't remember what the allowable was on my well. It was something better than that, of course, but I think we had a minimum of forty barrels per well at that time.

Q. Well, were you or were you not prejudiced more by that plan than you are under the present one with the number of wells that have been drilled?

A. I am prejudiced now more under the present plan.

Q. Substantially?

A. Yes, sir, I believe substantially. I would say substantially more.

Q. That case was never tried on its merits, was it?

A. No, sir, it was not.



Q. Has the Commission granted you any new permits when you filed some of these suits?

A. Yes, sir, they did.

Q. Now, Mr. Rowan, you testified about the Wood tract. Where is that Wood tract, now, with reference to your lease?

A. It is right south of the southeast corner of my lease. As a matter of fact, I think it is part of my lease, although the well is not on my lease.

Q. Was it first granted on your lease?

A. Yes, sir, the first stake was driven on my lease, on land I claimed.

Q. Was it later moved?

A. Yes, sir.

Q. All right, where is the highway there where that well is located?

Mr. Hart:

If the Court please, we wish to object to that as being immaterial to any issue in this case.

The Court:

This is not a trespass case, is it?

Mr. Tilley:

There is going to be a dispute as to whether or not this is one-tenth of an acre or one acre, and I just wanted to show if it is one acre it ought not to be put on the public highway. It is probably not very material.

Mr. Hart:

Our position is that the permit was granted to Wood to drill on a one acre lease, and that permit has been sustained, and that order of the Commission is not being attacked in this case and cannot be attacked collaterally, and for the purpose of this suit we have to assume he has a well there on a one acre tract. In other words, we can't

35 go into a question of title between Mr. Wood and Mr. Rowan.

Mr. Tilley:

We submit that the Railroad Commission cannot—and the Courts have so held—we are asking for an adjustment of allowable in this case, and the adjustment can't be made unless the Court has some general idea of how much acreage the man has and what the allowables are.

The Court:

It is a trial before the Court. I think I will let the evidence in.

Q. Where is that well in reference to the highway there, Mr. Rowan?

A. The County Highway runs right along by it, within close proximity to it.

Q. Now, when did you drill your first well and take possession of that lease?

A. In 1931, I believe.

Q. Did Mr. Wood ever come out there and demand or assert any possession until that permit was granted?

A. No, sir, not that I ever heard of.

Q. When was his permit granted?

A. I don't know when his permit was granted. His well was drilled and completed about August, 1937.

Q. Well, state whether or not it was within approximately six months—

Mr. Tilley:

We can agree on that, can't we?

Mr. Hart:

On what?

Mr. Tilley:

When it was granted to Wood?

Mr. Hart:

Yes, if you state it. You have it there, I suppose?

36 Q. While he is finding that, Mr. Rowan—  
August 22nd, 1937?

A. I think that is when it was completed.

Q. You had been producing oil for about six years from your lease before Mr. Wood came out there?

A. Yes, sir.

Q. Now, the Railroad Commission granted Mr. Wood, I believe you testified a while ago, or the pleadings admit, a permit on this tract and that you were granted a permit, but on motion for rehearing the case is still pending before the Railroad Commission. Now, if you were to drill that offset well that the Railroad Commission first granted you and then the motion for rehearing was granted would that give you any protection?

A. No, sir.

Q. Why?

A. Because one additional well wouldn't permit me to recover the recoverable reserves, an equivalent of the recoverable reserves, under my lease, under the present schedule of proration, as promulgated by the Railroad. I would have to drill substantially more wells in order to get my oil out before the field was depleted.

Q. How much do those wells cost you to drill them?

A. The way I would drill, around \$10,000.00.

Q. You would have to drill to his density to be equal with him?

A. Well, I don't know that that would help me even then, if everybody else drilled to that same density. I think I am going to have to have an advantage due to my position on the structure and the thickness of my sand and the reserves, based on the reserves that I have in the ground, in order to get my oil out of place before the field is finally depleted.

37

Q. At what rate was the Railroad Commission granting permits at that time?

A. Well, the first five months of this year they granted about 760 permits.

Q. You mean last year?

A. 1938, yes, sir. Pardon me.

Q. And that was during the time this permit was granted to you?

A. Yes, sir, during that period of time.

Q. If they give you that permit and grant other permits, then you will be in the same position, is that your point?

A. Yes, sir.

Q. And, yet, you would have spent all that money?

A. Yes, sir.

Q. Now, suppose you had drilled that offset, what would the other operators around there have done?

A. They would have drilled wells also, if they could have got the permits, and I guess they could.

Q. Now, Mr. Rowan, what part does the theory of offsets play in proration in such a field as the East Texas Field?

A. Well, I don't think it has any place at all in orderly development or in a proration order.

Q. If a proration plan is based on letting the operator, in preventing waste, withdraw the amount of oil that is estimated to underlay his tract, does the number of holes in the ground have anything to do with reference to that?

A. Well, I assume, Mr. Tilley, of course, that he would have to drill a well or some wells in order to get his oil out.

38 Q. Have you done that?

A. Yes, sir.

Q. What is the average density throughout the whole East Texas field?

A. One well to five acres.

Q. What is your density?

A. One well to five acres.

Q. All right, now, what is the spacing regulation over there?

A. The spacing regulation is the equivalent of one well to ten acres, 330 feet from property lines and 660 feet apart.

Q. How many acres will one well reasonably drain over there in the section of the field where you are, and throughout East Texas?

A. I think under a real conservation order where you are maintaining the bottom hole pressures and not withdrawing the oil out too fast, I think one well will drain ten acres.

Q. All right, can you withdraw the amount of oil which you assert you are entitled to with the present number of wells on your lease?

A. Yes, sir.

Q. I will ask you this question, under a plan of proration which contemplates permitting you to recover the amount of oil which is estimated to underlay your tract, can you at the same time prevent waste?

A. Yes, sir. I have known of wells over there to take all of the oil out from underneath my property. Under a conservation order which would take into consideration the factors which are necessary, and allocate the allowables to me, taking into consideration my recoverable reserves, that can be done.

Q. Could you produce your wells daily at such an amount and get that under the present allowable so as not to prevent waste?

A. Yes, sir.

Q. I mean the field allowable, of course?

A. The field allowable, yes, sir.

Q. Now, Mr. Rowan, have you made any computations here as to what you would get if this field was prorated on other plans?

A. Yes; sir, I have made some estimates.

Q. In making those estimates did you take into consideration the prevention of physical waste?

A. Yes, sir.

Q. Would those plans, a combination of those plans, permit the taking of oil over there, and especially under your tract, by you in an amount which you claim you are entitled to, could that be done without causing waste under these plans, that is, unnecessary waste?

A. Yes, sir, I think you could write an order over there, Mr. Tilley, which would prevent physical waste and would also give me substantially the oil or the equivalent of the oil which underlies my tract.

Q. And all the plants take into consideration the prevention of waste, at least to the extent of the present plan?

A. I think the prime fact in the prevention of waste over there is the top allowable, and I think you should distribute that allowable over the various leases in the field, taking into consideration the bottom hole pressure and the water table.

Q. Now, under a combination of those plans  
40 would you get substantially more oil than you get under the present plan?

A. More oil per day substantially, yes, sir.

Q. Mr. Rowan, if the present plan contemplated the giving of that operator the amount of oil based on the same percentage of his potential that yours would be based on, would such a plan on the potential basis such as the Railroad Commission now uses give you or not give you substantially more oil than you are now getting?

A. Now, you mean using potentials as one of the factors or just on a straight potential?

Q. A straight potential factor, disregarding any interpretation of marginal well basis?

A. On that basis and each well given its percentage of the potential of that well and not given an arbitrary



minimum for that well, then I would get a substantially higher allowable for my wells than I am getting now.

Q. Now, Mr. Rowan, have you made a study of the densely drilled areas throughout the East Texas field or some sections of the field where there are densely drilled areas?

A. Yes, sir, I have looked at the map and looked at and read the orders of the Commission where they have granted exceptions on small tracts.

Q. What have you found from these investigations?

A. Well, I have found areas in there that are very, very densely drilled, most of those areas. It is general throughout the field that small tracts have been granted more wells than necessary to protect vested rights, but  
 41 in the townsite areas of Kilgore, Gladewater and London there have been numerous wells drilled on small tracts. Also Overton.

Q. Was Mr. Wood one of the ones that had some of those tracts?

A. Yes, sir, he has some small tracts that have wells on them, other than the one he claims offsetting my lease.

Q. Mr. Rowan, what did you find over there with reference to density—just pick out certain cases, offhand. Did you find where there were as many as five wells to one acre or anything like that?

A. Yes, sir, I think there are leases over there in the various townsites that have that situation. The worst situation, of course, is at London, London Townsite.

Q. What is the average density there?

A. I made a computation of various tracts, and there is 154 wells on 51 acres. There is some tracts in there as small as half an acre with five wells on it.

Q. Do you mean the average density is three wells to one acre?

A. That is correct.

Q. What affect does that have, if any, on the other operators who like you are not so densely drilled?

A. It has the effect, I think, of taking somebody else's oil, in these densely drilled areas.

Q. All right, Mr. Rowan, do you know of any reason why in order to prevent waste it was necessary to drill more than one well on these one to five acre tracts in order to get the oil out from under those tracts, do you know of any reason?

Mr. Hart:

If the Court please, we wish to object to that. There are special facts arising in each case, and in  
42 each case the Railroad Commission takes into consideration those facts. I submit he can't know that, and I think it is improper for him to testify to it.

The Court:

He is qualified as an expert on it. He can testify to it for whatever it is worth.

Q. Mr. Rowan, do you know of any reason to prevent waste why they should drill more than one well on those tracts, those one to five acres?

A. No, sir, I do not.

Q. You say you have a tabulation here showing those areas?

A. Yes, sir.

Mr. Tilley:

And I want at this time to offer that.

Mr. Hart:

As of what date was that compiled, Mr. Tilley?

The Witness:

January 1st.

Mr. Hart:

May I see it?

Mr. Tilley:

I would like to offer in evidence the tabulation he testified about a while ago, which showed the number of barrels in place, and so on.

The Court:

Which is correct? On this one someone has corrected it with pencil.

Mr. Moody:

That is a note, your Honor, for another matter.

The Court:

This one has a question mark by it.

Mr. Tilley:

That is because there was a mistake of one per cent.

Q. Isn't that right, Mr. Rowan?

43 A. That should have been ninety-five. When  
and I had a little asterisk, and she took it for  
95.1.

(The above referred to documents were thereupon received in evidence, the same being marked Exhibits 1 & 2.)

Mr. Hart:

If the Court please, we wish to object to this offer of the schedule showing the density of drilling in certain isolated areas because there is no proof of the distance between those areas and complainant's lease, and there is no proof that he is being drained by any of the wells on these particular tracts, and for those reasons we object.

The Court:

I think it is going to regulation generally, isn't it?

Mr. Hart:

This complainant has to show he has been hurt.

The Court:

Yes; still, the general plan as to the reasonableness or unreasonableness of it is there.

Mr. Tilley:

In that connection, first, he testified this would effect him, it was draining his oil.

(The above referred to document was thereupon received in evidence, the same being marked Exhibit 3.)

Q. Now, Mr. Rowan, how are leases and royalties bought and sold in the East Texas field?

A. By the acre.

Q. How are they bought generally throughout Texas?

A. By the acre.

Q. You mean acre what, now?

44 A. Leases and royalties are usually bought by the acre, Mr. Tilley.

Q. In speaking of values, though, where you have a proven lease, what do you consider in the purchase of a lease?

A. We consider the underground reserves.

Q. When you bought this lease on what basis did you buy it?

A. I bought it on an acre basis, but I give consideration to the underground reserves on the basis of having paid a higher price for it. I wouldn't have paid that high price if I hadn't thought it had a higher content.

Mr. Hart:

We object to that as being irrelevant and immaterial to the issues involved in this case.

The Court:

I think that is going a long way afield.

Mr. Tilley:

If the Court please, they have admitted that, but the statute is that the order must be reasonable. Now, if the Court please, if we can show—

The Court:

I know, but that isn't shown by what he had in mind when he bought his lease.

Mr. Tilley:

We tried to show, your Honor, that leases over there now are bought and sold on an acreage basis, and the State is taxing them on an acreage basis. Now, if the State on the one hand taxes them on that basis and then in a proration plan doesn't give effect to that I think that shows the plan is arbitrary.

The Court:

The tax question is another thing. I think we all know that we can't hold the State to anything on account of taxes. I think the evidence is immaterial.

Mr. Tilley:

The Court will let us have our bill?

The Court:

If you want it for the purpose of the record you can put it in, but I wouldn't give it any consideration. If you want to put it in the record—

Mr. Tilley:

I would like for the record to show, if it is agreeable with the Attorney General, that if the witness was permitted to testify, that at the time he bought this lease in the East Texas field leases were bought and sold on a basis of the amount of oil under the tract, and that they are now taxed on all accounts on the same basis.

Mr. Hart:

I don't know what he would testify to. I wouldn't agree that those are exactly the facts.

Q. Will you testify to that?

A. Yes, sir.

Q. Will you further testify to the fact that they also consider acre sand feet?

A. Yes, sir.

Mr. Moody:

I would like to inquire of the Court. I don't understand the Court's ruling. Values are calculated on oil reserves and oil reserves are determined by acre feet of sand underneath the surface area of a lease. Does the Court hold that that—that testimony to that effect would be immaterial where the contention is, as in this case, that this order operates to deprive the plaintiff of its property without due process of law.

The Court:

I think so. You might go out and buy an oil lease on the assumption that you would get a lot of oil  
46 from the land and then regulation might come along and prevent you from doing it. It doesn't make any difference why you did it.



Mr. Moody:

I am getting away from how this man or any other individual might have bought it, but the method of determining value, the value of the oil properties is the thing.

The Court:

You have it in the record, haven't you?

Mr. Moody:

Yes, sir.

The Court:

If it is worth anything. Personally, I wouldn't give any consideration to it in the matter of passing on the validity of the order, but some other Court might.

Q. Mr. Rowan, what does the Railroad Commission call a submarginal well?

A. They list in the front of your proration schedule a list of wells they call submarginal wells, which are wells that won't make twenty barrels of oil per day.

Q. Now, how many of those wells are there?

A. 463 of them.

The Court:

How many?

The Witness:

463.

Q. Now, Mr. Rowan, do you have the—

The Court:

Do they allow them to make twenty barrels as an arbitrary figure?

47      The Witness:

No, sir; they allow those wells to make just what they will make. None of those wells will make twenty barrels. They are all wells that make less than twenty barrels.

Q. Mr. Rowan, do you have a tabulation showing the number of wells which are permitted to produce under a present proration schedule of from twenty to twenty-one barrels per day?

A. Yes, sir.

Q. How many such wells are there?

A. There is 21,179 wells in the field that produce twenty barrels, but less than twenty-one.

Q. All right, how many from twenty-one to twenty-two?

A. Two thousand.

Q. From twenty-two to twenty-three?

A. 1,831 wells.

Q. And twenty-three to twenty-four, and so on?

A. Twenty-three to twenty-four there is 319 wells; twenty-four to twenty-five there is 96; there is twenty-two wells that will produce over twenty-five barrels in the field.

Q. Then, as between the poorest well in the field, except submarginal wells, and the best well in the field there is only a five barrel differential in allowable?

A. Yes.

Q. Now, how many of those wells get as much as twenty-five and under twenty-six?

A. Twenty-two.

Q. A very small percentage?

A. Yes, sir, very small percentage of the total.

48      Q. Then, from your interpretation of that schedule, Mr. Rowan, state whether or not that field over there in East Texas, the East Texas field, if you know, is on a practically per well basis?

A. It is practically per well, yes, sir.

Q. If you don't—Mr. Rowan, you stated a while ago what the total daily allowable for the field is over there. Now, taking into consideration the allowable of twenty barrels to twenty-one barrels, how many wells are there there?

A. 21,179.

Q. A total of 25,900 wells?

A. Yes, sir.

Q. Less 375 submarginal wells?

A. Less 463 submarginal wells.

Q. Now, how much daily allowable for distribution between those wells which are given an allowable of twenty-two or more barrels?

A. Well, if you deduct the submarginal wells, which won't make twenty barrels, you have 25,440 wells, and if you allow those wells a flat allowance of twenty barrels minimum you have a total of 508,000 daily allowable, which leaves you from the top allowable—from the present allowable, I should say, about 14,000 barrels.

Q. About 14,000 barrels?

A. Of allowable that is distributed.

Q. On a potential basis?

A. On a potential basis, yes, sir.

Q. Now, tell the Court just how many wells are in the field, then, again on a per well basis and how many on a potential basis, and I think you have already, of course, stated very clearly what the amount of allowable is to be apportioned?

A. There is about 14,000 barrels to be apportioned, and there is about twenty thousand wells in the field that are on a per well basis, a flat twenty barrels per well.

Q. And a margin of five barrels between the worst well in the field, that is that will produce—not the worst, but one that will produce as much as twenty barrels and no more, and a well such as yours that will make twenty thousand barrels a day?

A. Yes, sir.

Q. What is the top field allowable?

A. For any well?

Q. No; of the whole field?

A. 522,000 barrels.

Q. Do you have the percentage there of the allowable that is allocated on a potential basis?

A. The percentage? It is 14,000 barrels. It is less than—

Q. About three per cent?

A. Right at three per cent, yes, sir.

Q. And the balance of it, of course, is on a per well basis?

A. Yes, sir.

Mr. Tilley:

We want to offer at this time the record that was made before the Railroad Commission at the time that he applied for the adjustment in allowable.

Q. In this connection I would like to ask you, Mr. Rowan, did you also make this same application before the three members or before the Railroad Commission at its regular monthly hearing?

A. Yes, sir, twice.

Q. You testified twice at those hearings or offered to testify twice, or both?

A. I testified once, and the other time I offered a written application.

The Court:

On what theory do you think that is admissible?

Mr. Tilley:

What theory, your Honor?

The Court:

On what theory do you think that record of the hearing before the Commission is admissible?

Mr. Tilley:

To show that we have exerted every effort we possibly could.

The Court:

The fact that you went before them would be admissible, but the record itself certainly would not be admissible unless there was some question raised as to whether the hearing was in compliance with law. It is just burdening the record with a lot of matter which nobody will read.

Mr. Hart:

We have raised the point they didn't offer such evidence before the Commission to justify the Commission to change the plan.

The Court:

I know; but this Court examines that de novo, doesn't it? This Court is not bound one way or another by that. Of course, there are some decisions that hold if the Commission didn't really have a bona fide hearing that the order is invalid, but I don't understand that there is  
 51 such a question as that raised here. That has come up before us a great number of times in these three judge cases. They were never appealed or taken up, but we have always held we were not bound by the evidence produced before a Commission.

Mr. Hart:

If they fail to offer any evidence at all to sustain their application before the Commission we can show that. They have to come before the Commission and show some

evidence to justify the Commission in changing the order or offering some plan that is sufficiently definite that the Commission can act on it, and our contention is that they haven't done that, and for that reason we will have no objection to the offer of the testimony before the Commission.

The Court:

If they want to put it in, I am not going to sit here and listen to you read it. It is easy to burden these records down with a lot of matters, but it is a different story when you come to write it up.

Mr. Tilley:

If the Court please, we don't think we have to go to the Railroad Commission if this is a void order, but we do want to offer it out of an abundance of precaution.

The Court:

I will let it come in evidence if you want to put it in.

(The above referred to record was thereupon received in evidence, the same being marked Exhibit 4.)

Q. Mr. Rowan, do you have royalty owners who own royalty under that tract there?

A. Yes, sir.

52 Q. Do they know of the condition which exists with reference to the Wood tract?

A. Yes, sir.

Q. Do you know whether or not suits are being instituted against these owners in the East Texas field by virtue of the condition which exists over there on your lease?

A. Yes, sir.

Q. Do you have reason to believe such a suit might be instituted against you?

A. Yes, sir.



## Cross Examination.

Questions by Mr. Hart:

Q. Mr. Rowan, I would like to get, if I can, first of all just what your position is with reference to the proration orders of the Railroad Commission. Do you have any objection to the proration order on the basis of the total allowable for the field?

A. For the field?

Q. Yes, sir?

A. No, sir, I do not. I think that it ought to be on a daily basis, and I think it ought to be spread over seven days a week. I don't think it is particularly good for the field to produce five days a week and to shut it down two days a week. I think the movement of water ought to come into the reservoir every twenty-four hours.

Q. In other words, you believe that the present method of proration, insofar as it fixes the top allowable at about the amount it is now fixed, is a good measure?

53 A. Yes, sir, I think it is all right.

Q. And you think so for the reason that by restricting the amount of oil which is taken from the whole field the energy, the water energy, is conserved, is that correct?

A. That is correct.

Q. The East Texas field is what is called a water drive field, is it not?

A. Yes, sir.

Q. The water drive comes from the west, is that correct?

A. That is correct.

Q. And is that water level at the present time approximately horizontal, if you consider the field as a whole?

A. I would say approximately horizontal. I wouldn't say it was definitely horizontal.

Q. Do you mean it varies from place to place over the field or that it may be at some angle from horizontal?

A. It is at some angle at certain places.

Q. In other places it is substantially horizontal, is that right?

A. Yes, sir.

Q. Now, you believe, then, that the proration order limiting the amount of the allowable of the field as a whole conserves energy?

A. Yes, sir.

Q. And thereby leads to a total greater recovery of oil from the field as a whole, is that correct?

A. Yes, sir, if that allowable is properly proportioned.

Q. I am talking about the total allowable. You don't have any quarrel with that, do you?

54 A. I don't think you can take a total allowable and say you can apportion that in any way and still prevent physical waste. I don't have any quarrel with the total allowable.

Q. Do you think by restricting the output of the field to approximately the figure the Commission has adopted by the present order you are conserving, and thereby increasing, the total yield from the field as a whole?

A. Yes, sir, I do.

Q. You do?

A. Yes, sir.

Q. Then, under this system, under a proration system, disregarding for the time being the question of allocation between tracts, but under a proration system there is a greater total greater recovery of oil from the field than there would be if there was no proration?

A. I think that is correct.

Q. You think that is correct?

A. I believe that is, yes, sir.

Q. Now, your quarrel, then, is with the method of allocation between the tracts?

A. That is correct.

Q. You claim, I believe, that you ought to be able to get 235 barrels a day, is that right?

A. About 222 at this time. About 220 barrels at this time, a day.

Q. Why has your figure changed from the time you filed your petition?

A. We recalculated our reserves and reduced  
55 them slightly.

Q. Didn't you get them right the first time?

A. We recalculated them and reduced them just slightly.

Q. Just tell me what new calculations you had to make in order to reduce them?

A. Reduced the sand thickness from one hundred feet to ninety feet.

Q. What caused you to reduce your figure on sand thickness that much between the time you filed your petition and this trial?

A. By the study of information that was available in the field.

Q. What information are you talking about?

A. Well, logs and Schlumberger logs.

Q. On what well?

A. Particularly Schlumberger logs on wells in the field close to us.

Q. Do you have a list of the wells you considered in determining that figure?

A. Yes, sir.

Q. Do you have it available?

A. No, sir, I don't have it with me. We have it on a map. It is going to be presented by the engineer.

Q. Do you have that available at this time?

A. I don't have it with me, no, sir.

Q. Will you have it so I can ask you about it after lunch?

A. Yes, sir.

Q. Now, you say that your allowable, your figure, your total allowable for your lease under your plan of proration ought to be about 220 barrels, is that what you said?

A. 220 a day, yes, sir.

56 Q. Now, would you prorate the total allowable of the field strictly on your basis or would you fix some kind of minimum allowable?

A. I might fix a minimum allowable for tracts. I don't think I would fix a minimum allowable to a well. If a man had a tenth of an acre and drilled three wells, I wouldn't give him a minimum for each well, no, sir.

Q. Tell the Court what minimums you would allow?

A. For each tract?

Q. Yes, sir?

A. I think five barrels for each tract per day.

Q. What size tract?

A. Any tract less than ten acres.

Q. You would allow to any tract less than ten acres only five barrels a day?

A. That is correct.

Q. Is that right?

A. That is my minimum, now, that is a minimum. In other words, you couldn't go below five barrels per day, that is right.

Q. Per ten acre tract?

A. That would be an arbitrary figure.

Q. You would just be giving it to him out of the graciousness of your heart. Do you put that on the basis of a seven day producing week or five day?

A. Seven.

Q. On the basis of a seven day week?

A. Yes, sir.

57 Q. Now, would you entirely disregard the number of wells that a man may have drilled on a ten acre tract under valid orders of the Railroad Commission?

A. Yes, sir.

Q. If a man, say, had drilled as many as three or four wells on that ten acre tract, you wouldn't allow him any more than if he had drilled only one well?

A. No, sir.

Q. In other words, you think that the investment that he has put in the wells that he may have drilled on that tract in ~~excess of the number that would drill it up to one~~ well to ten acres should be entirely disregarded by the Railroad Commission at the present time, in spite of the fact that this potential method of allocation has been in effect now for about five years?

A. Yes, sir, I think you ought to disregard it.

Q. You think that the Commission ought to enter an order, then, which will practically deprive him of his investment there?

A. I didn't say that. He can keep his investment there, but I don't think that the Railroad Commission ought to put an allowable on those wells whereby he can make a profit on them or guarantee him to get that investment back.

Q. You understand that the present method of pro-rata has been in effect since April, 1933, has it not?

A. I believe that is about right.

Q. Your suit in Fort Worth was tried before a three judge Federal Court in June of 1933, was it not?

A. I think that is the date.

Q. May 25th, 1933?

58 A. Yes, sir, that is about right.

Q. The Houston case you are talking about was tried prior to that time?

A. Yes, sir; I think in January.

Q. And that was the case where the Commission took into consideration purely the per well method of allocation, was it not?

A. No, I don't think so. I think the allowable at that time was based ninety percent on per well and ten percent on bottom hole pressure. There was some slight correcting factor.

Q. You spoke of filing some suits. Have you filed any suit between the suit tried in Fort Worth in May of 1933 and the suit which you filed in this case in September of last year, I believe?

A. I believe we have, yes, sir.

Q. What other suit was that?

A. I believe we have made an application for additional permits, and didn't get them, and we filed a suit in Judge Wilson's Court.

Q. When was that?

A. I don't remember just exactly the date.

Q. Do you know the number of the case or the style of it?

A. It would be Rowan & Nichols versus Railroad Commission.

Q. What was the outcome of that case?

A. It was set for trial at 10:00 o'clock on Monday morning, and about 9:00 o'clock the Railroad Commission or the Attorney General's office phoned and said the permits had been granted, and we withdrew the  
59. suit.

Q. What permits was that?

A. I think permits for Wells No. 3 and 4.

Q. Those were granted on July 5th, 1933, were they not?

A. I don't remember that.

Q. Look up your figures there.

A. Maybe I have it. Wells No. 3 and 4. I don't have the date that the permits were granted, but Well No. 3 was commenced, and I assume that the permit was granted prior to that time, on July 12th, 1933; and Well No. 4 on September 3rd, 1933.

Q. Well, don't you know, as a matter of fact, and haven't you previously testified that those permits were granted on July 5th, 1933?



A. I don't remember. They could possibly have been. They were granted prior to the time we commenced these wells, I will say that.

Q. All right. Now, was that suit you filed in Judge Wilson's an appeal from the order of the Railroad Commission refusing to grant a permit or an attack on the proration system?

A. No, sir; it was an appeal from the Commission refusing to grant us a permit.

Mr. Tilley:

I object to that, if the Court please, because the petition would be the best evidence; and I ask that that answer be stricken.

Mr. Moody:

He is an expert on oil, not law.

The Court:

Sustain the objection.

Q. Do you have a copy of that petition with you, Mr. Pawan?

A. No, sir, I don't.

Q. Could you get us a copy?

60 A. Mr. Tilley might have it. I don't know whether he has it or not.

Mr. Tilley:

I haven't it.

Mr. Hart:

If the Court please, I submit he ought to be able to testify what relief he was seeking in Court. We haven't made technical objections to these matters before.

The Court:

It is a matter between counsel, if they are agreeable to do it, but the objection is good.

Mr. Tilley:

Judge, if that wasn't five or six years ago I would agree to it.

The Court:

I don't see very much materiality in it one way or the other.

Mr. Tilley:

We will show him a copy of every petition we have, and I think we have every one, during the noon hour. We will let you have them.

Q. During that time and the time you filed this suit have you filed any suits of any kind attacking the pro-ration orders of the Railroad Commission, between those times?

A. No, sir. You are speaking of the one I tried in Fort Worth?

Q. All right.

A. No, sir, we haven't.

Q. At the time you filed this suit in Fort Worth there were approximately 10,000 wells drilled in the East Texas field, were there not?

A. I think about 9,000.

Q. You think about 9,000?

A. Yes, sir, I think that is about right.

61 Q. And since that time there has been drilled something over 16,000 wells in the East Texas field, has there not?

A. That is about right, yes, sir.

Q. Those wells, of course, have to be drilled under orders from the Railroad Commission, do they not?

A. Yes, sir.

Q. Either to prevent confiscation of the property or to prevent waste?

A. Yes, sir.

Q. And any person aggrieved by any of those orders can go into Court and attack the validity of those permits, can they not?

A. Yes, sir, I guess so.

Q. Now, your position is that the Railroad Commission should enter an order which would make it impossible for a man who has drilled his lease to a density of more than one well to ten acres to recover any profit or return on his investment, is that correct?

A. If in doing that they are going to take my property away from me and give it to him so he can make a profit, I do object to it.

Q. You take the position that the Railroad Commission should not consider the fact of this scheme of proration being in effect for something over five years, or take into consideration the number of wells that have been drilled while that order was in effect?

A. I take the position that they shouldn't consider that.

Q. You take the position that they shouldn't consider that, and if you are getting somewhat less oil  
62 than you think you ought to get they should change the order?

A. Yes, sir. During those five years I haven't set idly and not protested.

Q. Have you filed any application for a change in allowable with the Commission except the one you filed prior to this suit, in February, 1938?

A. Yes, sir; I have been down there in person.

Q. Do you have a copy of any applications?

A. No applications in writing, but I have been before the Commission in person and asked them to change the method of allocation.

Q. Do you have any of the records showing any of the hearings at which you appeared or what you testified at those hearings?

A. No, sir, I don't have them.

Q. Could you give us the dates of any of the hearings at which you appeared?

A. No, sir, I cannot.

Q. Did you ever at any of those hearings offer expert testimony?

A. No, sir, none except my own, and I wouldn't consider that very expert.

Q. You don't claim to be an expert, do you, Mr. Rowan?

A. I don't claim to be a petroleum engineer or a geologist. I think I have a lot of experience in drilling and producing oil. I think I know the fundamental principles of geology. I think I could look at it as just a matter of engineering, I could look at a contour map and tell what it was all about.

Q. Would a contour map mean anything to  
63 you?

A. Yes, sir, it would mean something to me.

Q. Would a potential contour map mean anything to you?

A. I could read it.

Q. Would it give you any information with reference to the potentials of the wells within the contour lines?

A. If made accurately, yes, sir.

Q. In other words, a contour map is an accepted method of determining points which have not been individually tested, isn't that true?

A. That is correct, but it is subject to error.

Q. Any method is subject to error?

A. Yes, sir.

Q. You yourself made an error, I believe, of the number of barrels you were entitled to under your scheme?

A. Yes, sir.

Q. Any method you adopt, therefore, is subject to a certain amount of error?

A. That is correct, yes, sir.

Q. Now, let me go further into your plan. I believe under your plan of proration you would allow a man who had, say, three wells on a ten acre tract to produce all of his allowable on one of those wells on that ten acre tract?

A. If it was situated in the middle of his tract I would, yes, sir.

Q. In other words, you would allow him to just plug in those two wells and produce all of his oil from only one of those wells?

A. He could plug them in or shut them in; 64 it wouldn't hurt.

Q. Your position, then, Mr. Rowan, is one well on a ten acre tract can bring in all the recoverable oil on that tract?

A. I think it can, sir.

Q. Has that always been your position, Mr. Rowan?

A. Yes, I would say so under proration, I think so, yes, sir.

Q. Haven't you applied for exceptions to the rule, exceptions to Rule 37 in drilling your Todd B Lease on the ground that by drilling four wells, rather than one well, to ten acres you would recover oil which otherwise would not be recovered?

A. I don't think so.

Q. When you drilled wells Nos. 1 and 2 on your tract what density did that give you on your tract?

A. A well to every twelve and one-half acres.

Q. All right, when you applied for wells 3 and 4, assume those wells were granted, what would your average density be on that tract?

A. It would be a well to six and a quarter acres.

Q. A well for how many?

A. Six and a quarter acres, just about six and a quarter acres.

Q. In other words, that would give you a density of more than one well to ten acres, wouldn't it?

A. Yes, sir.

Q. Mr. Tilley was representing you, was he not, at the time you applied for wells 3 and 4 on your B Todd Lease?

A. Yes, sir.

Q. The B Todd Lease?

A. Yes, sir.

Q. I show you here the brief or statement  
65 or arguments filed by Mr. Tilley in support of your application for wells 3 and 4 on your Todd B Lease filed with the Commission on October 11th, 1932, and I will ask you if that application doesn't contain this statement, "however, this applicant submits that the drilling of these additional wells applied for herein would in no way cause or create physical waste and that the ultimate recovery from said acreage would be greater if these permits were granted and these additional wells drilled, and therefore waste avoided by the recovery of this oil which would not otherwise be brought to the surface." I will ask you if that was not your contention at the time you applied to the Railroad Commission for wells 3 and 4 on your twenty-five acre lease?

A. I think I had enough wells on it at the time that I could have taken the oil out of it and not created physical waste.

Q. Well, didn't you take the position at that time that by getting these additional wells on your acreage, reducing your density from one well to about twelve acres to about one well to about six acres you would get a greater recovery of oil under your lease and thereby prevent waste?

A. I might have taken that position, but that is not my position now.



Q. That was your position when you were getting more wells in 1933, but it is not your position now?

A. No, I wouldn't say that.

Q. Well, what do you say?

A. I wouldn't say that I would say at that particular time—I felt that drainage was taking place from that lease, that is what I say.

Q. All right, let's see about that. Was your well at the time you applied—was your tract at the time you applied for wells 3 and 4 more or less densely drilled than surrounding tracts?

A. I believe at that time it was about the same density as the surrounding tracts.

Q. Well, let's just take up your lease then by the number of wells that you drilled. You got your first permits on October 10th, 1931, for wells 1 and 2 on your tract, did you not?

A. That is correct, just about that time.

Q. Now, both of those wells were granted as exceptions to Rule 37, were they not?

Yes, sir.

Q. If the Railroad Commission had enforced Rule 37 and refused to allow you to drill any wells that were within that rule you wouldn't have gotten any wells on your tract, would you?

A. That is correct.

Q. But to prevent waste they gave you two exceptions to start out with, didn't they?

A. Yes, sir.

Q. Now, at that time there weren't any wells drilled in most of the surrounding tracts around the Todd B Lease, were there?

A. In 1931?

Q. Yes, sir.

A. No, I don't think there was. I don't think there were many wells drilled in that particular area. I think we were one of the first to come in there.

Q. In other words, there were no wells then on the Sun-Allen Tooke A Lease, no wells on the Shell-Bassett Lease, no wells on the Amerada-Bumpus?

A. There was one location on the Arkansas Fuel. I believe the Arkansas Fuel had a well on their tract on their Houston-Stephens.

Q. There was one regular location on the Continental Oil Company's lease, was there not, Continental-Todd?

A. Our recollection is we drilled our well before the Continental, that is, the 1-A. I might be wrong about that.

Q. There were no wells on the Turner tract up here, were there?

A. No, sir; I don't think there were any wells north of that.

Q. No wells on the Magnolia tract?

A. No, sir.

Q. No wells on the Magnolia-Foster tract?

A. No, sir, I don't think so.

Q. No well on the Atlantic-Tooke B tract?

A. There might have been. That was a little ways away from our tract, and I don't remember whether there was or not, at that particular time drilling was pretty sparse in 1931, there hadn't been much drilling in that particular area.

Q. Now, when you were granted these exceptions by the Railroad Commission you were thereby granted a density of considerably more than the surrounding tracts, were you not?

A. No, sir; that is the situation, but actually  
68 I drilled those wells under orders of the Railroad Commission, the order of the Railroad Commission that granted one well to twenty acres. They put it on a basis of one well to a twenty acre unit, they said each person could drill a well on each twenty acres or a fraction.

Q. Your wells were drilled as exceptions to Rule 37?

A. Yes, sir, Todd B. That is on account of the narrowness of the strip of land.

Q. But they were granted as exceptions to Rule 37?

A. Yes, sir.

Q. And at that time the surrounding area around your tract was not drilled to anywhere near the density of your tract, was it?

A. I would say it wasn't. I don't know for sure.

Q. Now, in 1933 when you got wells 3 and 4 was your tract drilled to anywhere near the density of the surrounding tracts?

A. I think it was about the same.

Q. Well, now, let's see about that. On the Sun-Allen Tooke A Lease at the time that you applied for wells 3 and 4, which would give you a well to about six acres—

A. Now, just a minute. I don't understand your question. I understood you to say at the time I applied for that I had a well to twelve and a half acres then, and I think that was about the density of the surrounding territory. After I drilled those I think I was drilled up to a little bit bigger density after drilling those wells. I might not have understood your questions.

Q. In other words, after you drilled wells 3 and 4 you were drilled more densely than any of the surrounding tracts?

A. I think so, yes, sir.

69 Q. Do you know how many wells there are in the Sun-Allen Tooke A Lease?

A. I believe there is fifty-seven. I would have to look at a map to be sure. I believe it is fifty-seven.

Q. Well, there were three wells on there at the time you applied for your three and four. What would that make their density?

A. That would make a density of about eighteen, about nineteen. I guess between eighteen and nineteen.

Q. You had a density then of one well to twelve and you were trying to get a density of one well to six?

A. If that is correct, yes, sir.

Mr. Tilley:

We want to interpose this objection. We don't mind the—first, they are trying to impeach their own orders. They granted these permits. And second, the test as to whether or not these wells were wisely drilled is whether or not he would be entitled to get the oil which is estimated to have underlain his leases, and not as to how many wells there were on one tract or another tract at that time.

The Court:

What is the materiality of that?

Mr. Hart:

The materiality of it is this, if the Court please, they complain of the present orders of the Railroad Commission on the ground that a man is forced to drill additional wells in order to recover the oil that is under his land. He has complained specifically of the drilling in isolated areas throughout the whole field, and in some of the surrounding tracts. Now, I will say that our position is that he is not in position to complain about that because he has taken advantage of the fact that the Commission would grant exceptions to Rule 37, and has taken the initiative in dense drilling, and he himself has caused the dense drilling around his tract, and he is not in a position therefore to complain of it. That is, I understand, one of their complaints, the dense drilling of the surrounding tracts, and we wish to show he has initiated the dense drilling in this area.

Mr. Tilley:

If the Court please, we take the position that he is not relegated to ask for an adjustment in allowable if he can get enough permits to produce the oil underlying his tracts. That is all he has ever done. Unless they can show he is trying to get more oil than he was entitled to eventually or had created a waste condition I don't think it is admissible.

The Court:

Overrule the objection.

Q. All right, sir, let's take the Shell-Bassett Lease. Do you know how many acres there are in that lease?

A. No, sir, I don't.

Q. About fifty-four acres, aren't there?

A. That is about right, yes, sir.

Q. That lease at the time you applied for wells 3 and 4 had four wells on it. What would that density be there then?

A. 3 and 4?

Q. Yes, sir.

A. Had four wells on it, did you say?

Q. Four altogether, 1, 2, 3 and 4.

A. That would be approximately one well to  
71 twenty acres, eighteen acres. You say fifty-seven acres?

Q. Fifty-four acres?

A. Fifty-four. No, it would be about one well to about thirteen acres.

Q. About thirteen acres. That wasn't quite as densely drilled as your acreage?

A. No. Mine was a twelve and a half.

Q. Do you know how many acres there are in the Amerada-Bumpus Lease?

A. I believe there is over a hundred acres in that lease.

Q. That lease had six wells on it at the time you applied for wells 3 and 4. What would be the approximate density of drilling on that lease then?

A. Well, assuming also that it is a hundred acres, that would be six into a hundred. I will make the calculation for you. I am pretty slow in arithmetic.

Q. That would be something over one well to sixteen acres?

A. That is right.

Q. They were also less densely drilled than your lease?

A. Yes, sir.

Q. Let's take the Arkansas Fuel Company-Houston-Stephens Lease there. That is a fifty-seven acre lease. It shows here on this map they had at that time three wells. What would that make their density?

A. Fifty-seven acres and three wells?

Q. Yes.

A. That would be about seventeen acres, I believe, between seventeen and eighteen acres.

Q. About seventeen acres?

A. Yes, sir.

Q. Now, the Continental. They have a forty acre lease on the W. T. Todd, don't they?

A. Yes, sir.

Q. They at that time, I believe, had four wells, and that would make one well to ten acres?

A. Yes, sir.

Q. That is the lease that was a little more densely drilled than yours?

A. Yes, sir.

Q. All right. Now, the Magnolia at that time, the Magnolia-H. L. Foster, they had two wells drilled on their twenty-nine acre lease. What would their density be at that time?

A. Twenty-nine and two wells, that would be fourteen and a half acres.



Q. They were not as densely drilled as you were, were they?

A. Yes, sir, they were. No. No, they were not as densely drilled as I was.

Q. Then take the Atlantic-H. L. Foster Lease. They had two wells at that time, wells 1 and 2, and a thirty-one acre tract. What was the density of drilling on their tract at that time?

A. Two wells on thirty-one acres would be fifteen and a half acres to a well.

Q. Well, then, except for the Continental tract, which was only slightly more densely drilled than your tract, all of the surrounding tracts were much less  
73 densely drilled than your tract, all of the surrounding tracts, were they not?

A. That is correct, if the information you have read off to me is right. I don't remember, but I think you are substantially right about it.

Q. You don't have any doubt about it in your own mind at this time, do you?

A. No, I don't question it.

Q. You can check that up by the map; if I have made an error in that I would be glad to have you correct your testimony.

A. Yes, sir, I think that is right.

Q. Do you know how many wells were drilled as offsets to your four wells, direct offsets granted by the Commission because of your drilling to a greater density than one well to ten acres? How many offsets were caused on surrounding leases by your drilling?

A. On my four wells?

Q. Yes, sir.

A. I expect a good many, because that was in the early life of the field, and I expect there were a good many wells drilled in there right after that.

Q. Well, do you know how many there were?

A. I have no idea.

Q. You can't give us any idea of how many wells had to be granted as exceptions to Rule 37 because you got exceptions to Rule 37?

A. No, I don't.

Q. Well, would it be as many as twenty, or more than that?

A. Possibly.

74 Q. Possibly more than twenty?

A. Possibly twenty, yes, sir.

(At this time a recess was taken until 2:00 o'clock p. m., the same date, at which time the following proceedings were had:)

Q. Now, Mr. Rowan, at the time recess was taken this morning I believe we had about arrived at the point where we had gone around your Todd B Lease on July 5th, 1933, and shown that except for the Continental tract there weren't any of the tracts at that time drilled to as great a density as your tract?

A. That is correct.

Q. Then you drilled your wells three and four shortly after that, didn't you?

A. Yes, sir.

Q. That gave you a great deal greater density than the surrounding tracts, didn't it?

A. Yes, sir.

Q. And a much greater density than the average throughout the field at that time?

A. I don't know about that, but that statement is possibly true.

Q. Well, the general density in the field today is about one well to five acres?

A. That is right.

Q. And those wells were drilled back in 1933?

A. Yes, sir.

75

Q. And during that time there have been about 16,000 wells drilled?

A. That is correct.

Q. We would be safe in saying your wells were drilled to a much greater density than the field?

A. The limits of the field have been extended and more acreage taken in. At that time we were computing the field at possibly 110,000 acres, and I think there have been some extensions along the east side, and maybe up to the north, but not a whole lot.

Q. Well, you really change your ideas about the extent of the field and other factors of that kind whenever a well is drilled, don't you?

A. You do if it extends the limits.

Q. Each new well gives you new information about sand thickness and permeability and the character of sand, that goes to determine what the whole reserve of the field are?

A. I don't think so.

Q. You don't think a new well gives you any additional information?

A. It gives you some additional information, possibly, as to the extent of the sand right under that particular well.

Q. You don't think it helps you in determining the recoverable oil in the field as a whole?

A. In determining recoverable oil?

Q. Yes.

A. No, I wouldn't say so.

Q. All right, sir. Now, when was your Rowan & Nichols Well No. 5 drilled?

A. It was drilled in 1934.

76 Q. It was granted on May 2nd, of 1934, was it not?

A. I believe that is about right, yes, sir.

Q. And it was drilled, completed June 1st of 1934?

A. That is about right, yes, sir.

Q. Now, the drilling of that well was a result of these circumstances, was it not, on July 5th, 1933, when your well No. 3 was granted as an exception to Rule 37; then, as a direct and equal distance offset to that well No. 3 on your Todd B tract Sun Oil Company-Allen Tooke No. 5 was granted by the Commission as a direct offset to your well, is that right?

A. I believe so.

Q. And then as a direct and equal distance offset to Sun Oil Company-Allen Tooke No. 5, the Shell Oil Company-Bassett No. 6 was granted south of your tract, is that right?

A. Yes.

Q. And then you were granted No. 5, a direct and equal distance offset to Shell-Bassett No. 6 on May 2nd, 1934, is that correct? In other words, there was just a complete circle of exceptions to Rule 37 granted there starting with your well No. 3 and running around to your well No. 5?

A. I think that is probably correct. We drilled four wells in 1934, one on that lease and three up in A Lease.

Q. Just talk about this lease. This is the only one under consideration?

A. That is right.

Q. In other words, by drilling your No. 3 as an exception to Rule 37 you started those offsets which resulted in your drilling No. 5?

A. I don't know about that. I don't know that they drilled that because I drilled that well or not. They may have, and they may have had other motives.

Q. Don't you know the Commission granted it on that ground?

A. To the Sun?

Q. Yes, sir?

A. Maybe.

Q. Yes, sir?

A. I don't know; I expect they did.

Q. You don't have any doubt about those facts, do you? I can show you the record if you want it.

A. I expect that is the reason they granted it, but I don't know whether the Sun offset that well or not.

Q. Now, in 1934, then, you had five wells drilled on your lease?

A. That is correct.

Q. And at that time your lease was drilled to a greater density than the surrounding tracts, wasn't it?

A. That is correct.

Q. And it was drilled to a greater density than the average of the field as a whole?

A. That is correct.

Q. Now, at the present time if you take into consideration the average density of the surrounding tracts around your lease, or the average density of the field as a whole, you are drilled to approximately the same density as those tracts or as the field as a whole?

A. That is correct.

78 Q. And the field is just now catching up with you, isn't it?

A. That is correct.

Q. And now that the field has approximately caught up with you you want the allowable changed?

A. Yes, sir. That is not my reason, but I want it changed.

Q. All right. Now, you have not only drilled five wells, but you have received a permit to drill a sixth well?

A. That is right.

Q. Mr. Tilley asked you something about a rehearing on that application. The Commission granted you well No. 6, and the rehearing was on their refusal to grant you wells 7 through 25, was it not?

A. Yes, sir, that is correct.

Q. That is correct?

A. Yes, sir.

Q. So you still have a permit granted by the Commission to drill a sixth well on your tract?

A. That is correct, Mr. Hart, but the Commission says that that permit, that that well should be located in such a manner that we couldn't locate it.

Q. It was a direct and equal distance offset to the R. M. Wood well, was it not?

A. That is correct, but we don't know where that line is.

Q. Well, the Commission had given you a direct and equal distance offset, hadn't it?

A. According to our engineer we would have to drill it right in the middle of the County road.

Q. You knew where your line was, didn't you?

A. Yes, sir.

Q. You could put it just inside your line on your tract and off the road?

A. Off the road, yes, we could have done that.

Q. But you haven't drilled that well, have you?

A. No, sir.

Q. Now, Mr. Rowan, if I understood you correctly this morning, you said that you had not gotten away entirely from the principles of marginal wells or tracts, but you would keep a certain minimum allowable for tracts, is that correct?

A. I said as a matter of right and wrong I didn't think they were entitled to any minimum. You asked me if I would give it, and I said I would give it.

Q. You are the complainant here, and I want to know just what your scheme is. Now, would you or not allow a minimum to certain tracts, or would you just carry your scheme out without any allowance or minimum?

A. I would allow a minimum, yes, sir.

Q. Now, what is that minimum?

A. Five barrels.



Q. Five barrels for what?

A. Per tract.

Q. For how large a tract?

A. Well, I would say a ten acre tract.

Q. You mean you would allow five barrels for each ten acre tract or a tract that had less than ten acres?

A. Yes, sir.

Q. That had a well on it?

A. Yes, sir.

80 Q. Have you figured out how much marginal allowable there would be under your scheme?

A. No, sir, I haven't.

Q. Have you any idea as to whether or not the marginal allowable would be greater or less than the marginal allowable at this time?

A. I think it would be a lot less.

Q. I will ask you if there aren't a whole lot of tracts in East Texas—I believe you said thousands and thousands of tracts, in your petition here—that are as little as a tenth of an acre that have wells on them that you would have to allow five barrels to under your plan?

A. That is correct.

Q. You don't just know how much marginal allowable there would be, do you?

A. No, sir, I don't know. You would have to take a map and pick out those under ten acres and make a computation.

Q. And you would also have to figure out the reserves, wouldn't you?

A. Not if you have made an arbitrary allowable of five barrels in making that allowable; I think you would have to figure out the reserves under the whole pool, and possibly those tracts might have a greater allowable than five barrels, in which case you would give it to them.

Q. Do you have any accurate information that you can give the Court or us about how much the total marginal allowable would be under your scheme?

A. No, sir, I don't have any.

81

Q. You don't have any?

A. No, sir.

Q. All right, sir, now, why do you fix a five barrel figure as being your minimum?

A. It is an arbitrary figure.

Q. Well, now, of course—what do you mean by arbitrary?

A. An arbitrary figure I would fix because I think you ought to make some allowable for a man that has a little tract that has to drill a well on it so as to protect his lease and get his oil out.

Q. Well, how much allowable would you give him?

A. I said five barrels.

Q. Five barrels?

A. Yes, sir.

Q. Why do you pick out five barrels?

A. I think that is enough.

Q. Enough to do what?

A. Sir?

Q. Enough to do what, enough for what purpose?

A. Enough to justify him to drill it if he wants to drill it instead of pooling it with somebody else.

Q. Do you mean to say that a man with three wells on a ten acre tract, if he is allowed only five barrels for that, will get enough back to pay his investment and make any reasonable return on it?

Mr. Tilley:

If the Court please, we object to that testimony on this ground, that the law does not guarantee any man a return on his investment. If he doesn't have

82

enough oil under his lease he can't demand of the State to have a return on that investment or recoup his investment unless he had enough in the first instance to justify the drilling of that well.

The Court:

Is it the theory of the State that these parties, before they can enjoin a confiscatory order, have to show a better one?

Mr. Hart:

I think they ought to give some idea of how their scheme will work.

The Court:

The burden rests on them or the Commission?

Mr. Hart:

I think the burden rests on them to show the order of the Commission is unreasonable.

The Court:

If they do that they don't have to give them another one.

Mr. Hart:

If they grant that a total allowable is desirable, and if they can show no fairer way of allocating than the present, I think they have shown no ground of enjoining the present scheme. In other words, if their scheme would lead to waste and is unfair then they have no grounds for enjoining the action of the Commission.

The Court:

You seem to be going into that a good deal at length. I always thought that if you had a confiscatory rate or order that the party could enjoin it and he didn't have to draft another one that was better, that rested with the rate making body or the order giving body.

83 Mr. Tilley:

We think that is the law, Your Honor, and we have authorities to that effect, if the Court would like to see them.

The Court:

Of course, it may have some bearing on the reasonableness or unreasonableness whether you can pick out any better order.

Mr. Hart:

If the Court please, we are in this position, where they agree that proration is a good thing and a certain allowable should be allowed the whole field. Then the question is how are you going to divide it. Now, unless they offer a better scheme than the one the Commission has in effect and has had for over five years there would be no point in enjoining the Commission. Our point, furthermore, in connection with this line of questions that I am now—

The Court:

It might be, of course, that this order would be invalid as to these particular people and might not be invalid as to others.

Mr. Moody:

If the Court please, furthermore, if we show the order is in its application either generally or in this particular case confiscatory in its nature and is therefore an order that can't be enforced, I think that is all the plaintiff would have to prove. The plaintiff has no right to promulgate orders. We have no right to tell them what to do. I think then if the Railroad Commission could show that this is the only order I think that might be—I can't hardly conceive that that would be a defense, but certainly a part of the burden that rests

upon a person who says his property is being taken unlawfully ~~isn't~~ to come in here and show the Railroad Commission some other order. I think when we show our property has been taken we have made a case.

84 Mr. Hart:

I think if they can show their property is being confiscated they have made a case, but if they concede the withdrawal of oil should be limited in some way, unless they can show a fairer way than the one the Commission adopted they have no right to come in and ask for relief, and furthermore what we are trying to show now is the scheme they are proposing would lead to the confiscation of all the people that have drilled these wells since the order was adopted.

The Court:

The scheme he supported is just something he thought was good, but I don't think any burden is on them to put forth such a scheme. The question is as to the validity of the order you have. Of course, when you go into this phase of it with him you can do that, and it may throw some light on whether the order is reasonable or unreasonable, but I wouldn't like to push it to the extent you are pushing it.

Q. Now, Mr. Rowan, you have set a five barrel per tract minimum. Now, that minimum is less than five barrels per well per day, might it not be? In fact, in many instances it would be less?

A. Probably in many cases it would be less.

Q. Now, how much does it cost, an oil well, about?

A. Well, the way I would drill my wells over there it would cost about \$10,000. There has been wells drilled over there, I think, as low as \$7,500.00.

Q. About \$10,000?

85 A. By putting smaller sized casing and tubing than I have been in the habit of putting in mine.

Q. Most of these wells flow for a while and then go on the pump, don't they?

A. Yes, sir; I think the majority of the field is still flowing.

Q. How much does it cost to put a well on the pump?

A. It costs about \$2500.00.

Q. How much does it cost to pump a well after it gets to pumping, do you know about the cost of that?

A. Yes, sir; it depends on whether you have got one well or two wells and three wells or four that your man is looking after. He could do it pretty economically under the right conditions.

Q. About how many barrels would be required, as you see it, to make a reasonable return on your investment in one well, how many barrels a day?

A. You would have to take into consideration the price of oil.

Q. The present price of oil?

A. \$1.25. I would have to figure that up.

Q. Have you made any effort to figure that up?

A. No, sir.

Q. Does your five barrels to each ten acre tract a day have any relation to what oil a man ought to be allowed to take out of his tract in order to pay back the cost of the well?

A. No.

Q. It hasn't any relation to that?

A. No.

Q. Isn't it a fact, Mr. Rowan, that if you set a minimum of anything less than the present marginal limits, which with the Saturday and Sunday shutdowns, amounts to about fourteen barrels a day, you can't operate a well and get back your money and get any kind of return on your investment?



86 A. Well, there are thousands of wells over there that are paid out and pay a nice, handsome return, and I think all of those wells—none of those wells would be plugged, I think, at five barrels a day, they would be still either flowing or pumping like some of those submarginal wells are doing on the east side.

Q. Now, do you mean to say that at five barrels per ten acre tract per day you would be justified in drilling a well of that sort?

A. Not now.

Q. Suppose you had a tract of ten acres that had some oil?

A. That hasn't been drilled?

Q. Yes.

A. I don't think that condition exists over there at this time.

Q. Well, under your scheme it couldn't profitably be drilled, could it?

A. No, sir.

Q. And the oil would not be recovered from under that tract, would it?

A. Not by the man that owned it. It might be by somebody else.

Q. But the man owning the oil under that tract, it wouldn't be profitable for him to drill the well there to get the oil?

A. That is correct. We have some properties in New Mexico where we have oil but it is not profitable to drill.

Q. How much would you allow a man like Mr. Wood?

A. Five barrels per day.

87 Q. Would that pay back his investment?

A. I imagine most of his investment has already been paid back. If it hasn't, and he was starting out to drill that well now it would take him a long time

to get it back at five barrels. He would eventually get it back if the field lasted as long as fifteen years.

Q. Now, Mr. Rowan, I believe you testified that your well is located in what is known as the Fairway?

A. Yes, sir.

Q. That your tract is located in what is known as the Fairway?

A. Yes, sir.

Q. Your tract is somewhat closer to the eastern side of the field than to the western side of the field, isn't it?

A. That is correct.

Q. It is approximately five miles away from Glade-water?

A. Yes, sir, that is right.

Q. Now, your tract, you said it is one hundred per cent drilled on exceptions to Rule 37?

A. That is correct.

Q. The field as a whole, on the other hand, is only fifty per cent drilled up by exceptions to Rule 37?

A. That is correct.

Q. And if you take the average density throughout the whole field, why, you have about the same density as they?

A. That is correct.

Q. The same density of drilling?

A. Yes, sir, the same density of drilling.

Q. And the whole field has been drilled up  
88 to the present density on the same plan as your tract, has it not? One man will make an application for an offset and another another, and that led to spacing of the wells over the field as they now are spaced?

A. Yes, sir, that is what happened.

Q. Did you take any cores on the wells under your tract?

A. Yes, sir, we took some cores.

Q. You took some cores?

A. Yes, sir.

Q. Did you report those cores to the Commission?

A. I don't know whether we did or not.

Q. You made the cores as the wells were being drilled?

A. Yes, sir.

Q. You don't know whether those reports were made to the Commission or not?

A. No, sir, I don't know, Mr. Hart. I don't believe they were, though.

Q. Did you core the full sand or just a part of it?

A. No, sir, just a part of it.

Q. How deep did you drill your wells?

A. The deepest well, as well as I remember, is drilled sixty feet into the sand, and I don't know whether that is—yes, I believe that is on the B Lease, too. I believe we have one well drilled sixty feet into the sand on the B Lease, and I believe that is well No. 3.

Q. Did they hit the top of the Woodbine sand at the same sub-sea depth?

A. No, not exactly the same, but very close.

89 Q. How much variation between the wells on your tract?

A. Oh, there may have been a few feet.

Q. Well, isn't it a fact that on the five wells that have been drilled there was as much as thirteen feet difference?

A. That is possible.

Q. In the well logs at the sub-sea depth at which you hit the Woodbine sand?

A. That is possible, yes, sir.

Q. Your well is more favorably situated than either the wells on the west or east of you, is it not?

A. I didn't get that question.

Q. I say your lease is more favorably situated on the structure than the tracts either to the west or east of you?

A. Well, immediately to the east and west, why, I would classify them about the same. Now, if you go, start going westward I think our lease is better as you get further west and better as you get over on the east side. There is an area around there that I classify practically alike, there is not much difference in it.

Q. Well, about how much distance from your well east or west is it that the tracts were about the same?

A. Without looking at the map I would say half a mile to the east and possibly half a mile to the west.

Q. All right, sir, about half a mile each way. Now, the tracts that are on the western edge of the field are underlain by bottom water, are they not?

A. That is correct.

Q. Is that water at a uniform level or is the  
90 water at varying levels there?

A. I think it varies a little.

Q. About how much does it vary?

A. I don't know.

Q. Do you have any accurate information on that, Mr. Rowan?

A. We have an engineer here that has a water map, or he has made some cross sections on it. We are going to introduce that in evidence. I don't have that in my own mind.

Q. Has the water gotten underneath your tract yet?

A. No, sir, I don't think it has.

Q. How are you going to tell just exactly how far the water level has reached on any tract unless it starts producing water?

A. There are some wells that have produced through the Woodbine section, and they run Schlumberger logs on them and they show the water on it.

Q. If you run far enough down to hit water you know about where the water level is on that well?

A. Exactly where it is, yes, sir.

Q. Assuming inaccuracies, you know just about?

A. Yes, sir.

Q. On tracts where you don't drill into the water you have to guess where the water is?

A. You have to project your water line, yes, sir.

Q. Like you project your contour lines, and things like that?

A. Yes, sir.

Q. You have to guess the best you can where the water line is?

A. I don't believe it a question of guessing.  
91 you can assume it is fairly normal.

Q. Does the water rise on a horizontal plane, taking the field as a whole?

A. Yes; I think you could say substantially, yes, that it rises on a horizontal plane. Certain areas might pull in there and may show to be a little bit higher in certain areas than others.

Q. Sir?

A. In certain areas it may show to be a little bit higher than others.

Q. Which areas are those?

A. Well, I don't know. We have a water map here, our engineer has a water map here, and we are going to submit that as information.

Q. You don't have that information yourself?

A. I don't have it in my mind, no, sir.

Q. You submitted this morning a list of tracts which are drilled to a greater density than your tract, townsite areas?

A. Yes, sir.

Q. Which one of those tracts is within five miles of your lease, if any of them?

A. Those wells in the Gladewater Townsite are, I think, within just about five miles.

Q. Are those wells draining any of your oil?

A. I don't think so, no, sir.

Q. They are from the west, and the water drive comes from the west? \*

A. Yes, sir.

92

Q. So, the dense drilling in those Gladewater Townsites you submitted to the Court this morning, that doesn't cause any loss of oil from your tract, does it?

A. No, sir.

Q. Take the Kilgore area, how far is Kilgore from your tract?

A. Kilgore is twelve or thirteen miles.

Q. Are you losing any oil to the wells down there in the Kilgore area?

A. I think we could; I think your drainage could be either north and south or east and west if you developed a pronounced low pressure area to the south of us or to the west of us or to the north.

Q. Do you mean to tell the Court, Mr. Rowan, that there would be a drainage of as much as eighteen miles in the East Texas field?

A. There would be a drainage?

Q. Yes, sir.

A. Well, if you had a lot of wells in between there the drainage could be gradual.

Q. I am asking you if you are making the statement to the Court that it is your opinion that you have lost oil to the wells in the Kilgore area, eighteen miles away?

A. I am not going to make that statement, no, sir.

Q. Well, what about the Overton area—I believe that was another one of those areas?

A. Yes, sir.

Q. How far is Overton from your wells?

A. Farther still.

93

Q. About how far away?

A. I would say twenty miles, just guessing at it.



Q. Now, Overton is on the west side of the field, isn't it?

A. That is correct.

Q. Instead of oil being driven from your tract toward their tract, oil is going the other way, isn't it—it is going from west to east by the water drive?

A. Yes, sir.

Q. So you are not losing any oil to the Overton tracts, are you?

A. No, sir.

Q. What about London Townsite, how far is that away from your lease?

A. Well, I am going to estimate it offhand. I have driven it, and I am going to estimate it at about thirty miles.

Q. There is not any of your oil going down to those wells around London, is there?

A. I doubt it, I doubt it very seriously.

Q. What other areas did you include in that list?

A. That is all, Mr. Hart.

Q. That is all?

A. Yes, sir.

Q. Well, you are not losing any oil to any of those areas, are you?

A. No, sir; we just picked that out as a general idea of how the field has been developed. There are certain tracts, of course, to the east and north of us that have been drilled up on a considerably greater density. We have just picked those out as general areas to show that there were general areas in there that had been  
94 drilled up to a very low density.

Q. You don't take the position that because there may be some inequalities that the whole scheme will have to be thrown overboard, do you?

A. No, sir.

Q. And when you consider the situation in the whole you have as great a density of drilling as the whole field, don't you? —

A. Yes, sir.

Q. So, you really haven't got any complaint on the density of drilling of wells, have you?

A. No, sir, not on the basis of density of drilling, no, sir.

Q. Now, where are the biggest potentials in the field, Mr. Rowan?

A. They are in the middle of the field, what we term the Fairway. We have used that expression before.

Q. The lowest potentials are around on the edges, aren't they?

A. I believe you will find the lowest potentials on the east edge.

Q. The lowest potentials are on the east edge?

A. Yes, sir.

Q. And generally the potential contours come around until you get there in the Fairway right around your lease, and you have the biggest potentials in the whole field?

A. That is correct, yes, sir.

Q. And your contention also is, is it not, that the greatest reserves are in that part of the field?

A. Yes, sir.

Q. There is some connection between the potentials and the amount of reserves under the tract, is there not?

A. I think the thicker your sand—the potential would indicate the thickness of the sand, but

95 I don't think it indicates the amount of reserve you have.

Q. Now, let me get that. You say the potential indicates the thickness of the sand but not the amount of the reserve?

A. That is right.

Q. Explain that. What is the difference between the thickness of the saturated sand and the amount of the reserve?

A. The measure of an oil reservoir—if you wanted to estimate the number of cubic feet of air in this room you would have to have length and width and breadth, and the same thing if you were estimating feet of water in the Buchanan Dam, you would have to take the cubical contents to estimate the amount of water in that dam. And when you estimate the number of barrels in an oil reservoir you have to estimate the length, depth and thickness. We use acreage and then thickness of sand, which we call acre thickness of sand, but the potential doesn't indicate the thickness.

Q. I thought you did say it indicated that but not the amount of reserve?

A. I said that it indicated possibly the thickness of sand, but I didn't say it indicated the acre feet of sand thickness, because you have to take three dimensions to get the amount of reserves you have underground, not just one.

Q. Yes, but if the amount of potential indicates the thickness of sand, you know the area on the surface, don't you?

A. Yes, sir.

Q. Wouldn't it be a simple matter to calculate it?

A. That is what we have done.

96 Q. Then, do you think a potential method is a fair method of determining the amount of sand thickness?

A. I think in your thicker sand areas you are going to get bigger potentials, but I think that the actual sand thickness that you can core or run a Schlumberger on is more accurate than the potential test you run.

Q. But you do concede that the potentials reflect, in some amount, the amount of saturated sand thickness under a lease, is that correct?

A. Yes, sir, that is correct; in East Texas it indicates somewhat that.

Q. You say there are more accurate methods of determining thickness?

A. That is correct.

Q. How do you do it?

A. Either by coring or by a Schlumberger log.

Q. How many wells in East Texas have been cored?

A. I don't know.

Q. Sir?

A. I don't know. There are thousands of them, I guess—not from top to bottom.

Q. Isn't it a fact that less than five per cent of the wells in East Texas has been cored?

A. I don't know about that. I would say from top to bottom, yes, a complete section.

Q. Well, you have to take a complete section of sand to have any accurate information?

A. Yes, sir, you would have to, to have accurate information.

Q. And there have been about only five per  
97 cent of the wells cored?

A. Yes, sir; but there have not been that many potentials taken. They have only taken the potentials on a hundred wells, as I understand, or 103, so you would have much more information on core records than potential records.

Q. It is pretty easy to take a potential on a well, isn't it?

A. It is pretty dangerous the way you are taking them.

Q. But it is easy to take a potential test on a well?

A. Yes, sir—it can be done.

Q. How are you going to core a well after it has been drilled?

A. You can't do it unless by side cores. You can run a Schlumberger test as to the thickness of the sand.

Q. Do you know how much a Schlumberger test costs?

A. Yes, sir.

Q. About how much?

A. Well, they make a \$50.00 service charge, and then charge 3¢ a foot down to where they start taking the reading, which in East Texas would be where you start taking the reading, because you wouldn't want a Schlumberger for the upper part of the hole—which would be three times thirty-five or thirty-six.

Q. Doesn't the total cost run about \$300.00 a well?

A. No; it would cost you in East Texas, I think, about \$175.00.

Q. Now, how accurate—how far does that Schlumberger test indicate the conditions in the sand around the well, how far out in the sand would it indicate the conditions in the sand?

A. How far out?

98. Q. Yes, sir.

A. It wouldn't indicate the conditions out in the sand, it would only indicate the amount of sand you had and where the water was, the porosity.

Q. Right there immediately around the well bore, is that correct?

A. Yes, sir.

Q. Now, if the well is not drilled all the way through the sand you don't get any information by a Schlumberger test unless you drill a well all the way down to the bottom of the sand and into the water, do you?

A. Correct; it would only give you a reading on that portion of the sand you run it into.

Q. Most of the wells are not drilled through the sand, are they, into the water?

A. In the last year I would say a great many were drilled through the sand, and Schlumbergered and the holes set in casing.

Q. You couldn't use a Schlumberger on those kind, could you?

A. You wouldn't want to on those that had already been Schlumbergered and a pipe set in unless you just wanted to make another test or check your first one.

Q. Now, I am going to get at this. You say there is a better way the Commission could use in determining the sand thickness than the potential, which you say reflects it to some extent. Now, would you advocate taking Schlumbergers on the wells, or how would you advocate finding that out except by potential?

A. I think I have several different ways. In  
99 the first place, you have 25,000 wells, a little over that, which show the top of the sand. You can certainly contour the top of the sand, you know where the sand begins. And on the west side of the field you know where the water level is. On the east side of the field there have been a great many wells that have drilled through the sand, and I believe there has been possibly six hundred Schlumberger tests that have been run in various sections of the field. And you could take all that information and supplement it with your core records that have been made in various areas in the field, and I think you would find that you would have a pretty accurate picture of the sand thickness.

Q. Well, now, as to the top of the Woodbine sand, is that regular or irregular?

A. It is slightly irregular.

Q. It is irregular, isn't it?

A. Yes, sir.

Q. If you went to contouring by the top of the sand, running contour lines, you would inevitably have some inaccuracy, wouldn't you?

A. Well, they would be subject to the same inaccuracies you have on any contour line, that is all. You have so many wells in there that it gives you points of contact. I think in East Texas, with all the drilling that they have done, you would have about as accurate a contour map on top of the sand as you could possibly



have in any field I have ever had any experience with.

Q. Now, if you have as much as thirteen feet difference on one lease there, your lease, why doesn't that same variation occur over different tracts in the field?

A. Probably there is some variation all the way over.

Q. Now, then, the top of the sand is irregular, is it not, as you have stated?

A. Slightly irregular.

Q. And what about the bottom of the sand, is that regular or irregular?

A. Well, eventually—originally, I believe—

Q. You mean to say—

A. You mean on the east side, now, or the west side?

Q. Well, take it all over?

A. Well, on the east side I would say that it was slightly irregular, on the east side, the bottom of it, and on the west side originally I think probably the water all laid underneath that oil bearing formation on a pretty horizontal plane.

Q. Well, now, has it changed in level since those wells were originally drilled?

A. The water level has changed some.

Q. And it is now irregular, is it not?

A. Slightly irregular.

Q. And you have the sand thickness, that is irregular, the top of the sand is irregular, and the water level is irregular?

A. Yes, sir.

Q. Now, would you take both of those factors into consideration under your method if you were undertaking to determine the amount of reserves under any tract?

A. Irregular on top and bottom?

101 Q. No. Would you take into consideration the top of the sand and the water level in determining the amount of reserves that were in place under the tract?

A. You would have to take averages, -yes, sir, average it up.

Q. You would have to average it up?

A. Yes, sir.

Q. Would you give a man actually the thickness under his tract or would you give him an average?

A. Give him what he had under his tract.

Q. How would you find that out?

A. I would determine the average top of it, and if there were irregularities in the bottom of it I would determine the average bottom of it just like you do on a land survey on top of the ground, and then give him that average. It would be substantially correct.

Q. You have two elements which you say are irregular and which you say you would have to try to arrive at some guess in determining the amount of reserves, the irregular top of the structure and the irregular bottom where the water is?

A. Slightly irregular on both, I would say.

Q. What about the character of the sand there, is that all one sand of the same character, or not?

A. No, it is not. You mean all over the entire field?

Q. Yes, or on your tract or on the entire field?

A. No, sir, it isn't all of the same character.

Q. What are the various kinds of sands there?

A. Well, it varies; on the east side you have  
102 some sand that is shaly, and in the middle of the field you have, right in the top of the sand, you have a little ash, and farther on down in the sand you have some gravel in the middle of the field, and you have some shale streaks there in the middle of the field.

Q. In other words, Mr. Rowan, the East Texas Woodbine sand is not a homogeneous section of sand, is it? They have all sorts of variations within that reservoir?

A. It is not a solid section of sand, there is some variations.

Q. There are some variations?

A. Yes, sir.

Q. In other words, in some areas you will find tight sand, will you not?

A. Yes, sir.

Q. In other areas you will find lenses of shale and volcanic ash which impedes the free movement of the oil?

A. Yes.

Q. You find in some areas sand that is so thick or big that it is almost gravel, don't you?

A. Yes, sir. I don't know that I would find any grains, that I have ever seen any grains of sand as big as gravel. I have seen considerable gravel in the sand over there.

Q. Well, now, how would you find out under any particular tract, under your method, of what the character of the sand was underneath any particular tract so that you could allow to it a fair share of the oil which would give you a better idea of the character of the sand than on the potential test?

A. I think the sand in the East Texas field 403 is fairly uniform. I think it is uniform enough that you could assume its uniformity.

Q. Haven't you just said that it is not uniform, that it has a whole lot of variations in it?

A. That is correct, but those variations are on the east side, middle and west side and on the north and south, that is where they are.

Q. But you would take an average and give a man something based on an average instead of actually trying to find out what was under his tract?

A. I wouldn't try to find out exactly how many inches of ash or shale he had in there, although, if that particular operator wanted to find out he could find it out.

Q. You would put the burden on the operator?

A. I would take the information the Commission has now, and use that, or they could get it.

Q. You would put the same burden on the operator; if he is not satisfied with the potentials he could get another made?

A. He could go get one if he wanted one.

Q. You haven't asked for any potential tests on your well, have you?

A. Yes, sir, I asked for one.

Q. When was that?

A. It was back—right after the shutdown period.

Q. When this formal proration order went into effect?

A. Right after that.

Q. You got your test made, did you not?

A. Yes, sir.

Q. I believe you talked about Mr. Griffin coming out there. Isn't it a fact that Mr. Griffin pointed out to you that you might fix your equipment so you could get a higher potential, and you said it was all right, to just go ahead?

A. I think possibly so. I think he and I did discuss it.

Q. You haven't complained as to the way the Commission treated you on that test, have you?

A. No, sir.

Q. The Commission has been very fair in assigning you your potentials, isn't that correct?

A. As far as the potential is concerned I have no complaint.

Q. Then, what you were talking about this morning, so much back pressure and things of that kind, you don't mean to say the Commission treated you unfairly in an assignment of potentials to your lease?

A. No; what I meant to say was under similar conditions with these other wells, that I thought my well probably was as good as any well in the field, maybe, that made a 1,000 or 1,050 or 1,100. I wasn't making any

complaint as to the manner in which the Railroad Commission—as to the test.

Q. While I am talking about that, you spoke about the gas came out of the oil, I believe, when you were having that potential test made; about it going down the valley there for some distance?

A. Yes, sir.

Q. You asked Mr. Griffin to take that test early in the morning?

A. I suggested it be taken early in the morning.

Q. You were willing to do that because you  
105 would get a higher allowable?

A. That is correct. The other potentials had been taken during the shutdown period, and during the shutdown period the bottom hole pressures had built up, and by taking these potentials at different scattered places over the field they were able to utilize all of the energy that was stored up there. In other words, there wasn't any other wells flowing that would be flowing energy away from them, and they came along there—I came along there and asked them to take a potential on my well, and Mr. Griffin suggested that the early morning was better because the practice was to flow the wells at night, and a good many of them would have been shut down, and possibly by that way I might be able to use the reservoir energy a little bit better. That is the reason it was taken early in the morning, at his suggestion.

Q. In other words, you took it early in the morning so you could get a higher potential?

A. That was the idea, yes, sir.

Q. If you had waited until noon, after the air had warmed up, the gas could have escaped up into the air without danger of fire, couldn't it?

A. To a greater extent than it did, but I still think that due to the wet content of the gas it would still have

been heavy enough to have hung on the ground to a certain extent, and have been a fire hazard.

Q. Do you mean from that that you ought never to taken a potential test on a well to determine how much oil is to be allocated to it?

A. I don't thing you should take it without  
106 putting it through a trap or a separator.

Q. You still think the potential test is a method of determining the potential capacity of a well, don't you?

A. Not a three hour period, I don't think it determines it except for that three hour period.

Q. Would you let the whole field run wide open if you wanted to know the potential capacity, or would—how long would you let it run wide open?

A. Not for three hours. If I wanted to get a real potential—of course, I realize with 20,000 wells they couldn't take a potential test on that whole field running it wide open for twenty-four hours. I realize that is impossible, but that information would give you a lot more information than the test they make.

Q. You understand, Mr. Rowan, the Commission has to go at it in a practical way, and if it not practical the Commission cannot follow it?

A. That is correct.

Q. You wouldn't advocate a method of change of taking potentials so they would run the whole field wide open for three hours, would you?

A. I think it would be a physical impossibility to do it.

Q. So the Commission has to do about the best they can, and the best they can is to take a potential without holding the field wide open, the entire field, but just on one well at a time, taking it on just one well at a time.



107 A. If they want to base an order on potential, if they want to do that, that is about the only way they can do it.

Q. They have adopted about the only way they can, if they are going to take it on a potential basis?

A. They could take more wells; and if they were going to take more wells they could take one a day over a period of time, and they could have every well in the field tested. They can keep on taking more than one hundred.

Q. But anybody that feels like he is not getting enough can get a potential made.

A. If the Railroad Commission had arbitrarily allowed him 200 or 300 I think he would be crazy to come in and complain and ask for a test to be made. And, of course, most operators know what their wells will make, and they wouldn't come in and ask for a test on a well that they are already getting more allowable or potential assigned to it than it would make. Consequently, those operators are not going to complain.

Q. You can ask for a test of the whole field, can't you, all key wells?

A. I don't know whether they ought to permit that.

Q. If anybody feels he is being aggrieved, either by the potential on his well or the field as a whole, he can have a new test made of the key wells, can he not?

A. Probably on key wells, but I don't think on every well in the field.

Q. You are not saying they wouldn't do it, are you?

A. No, sir.

Q. Now, you talk about the regularity of that sand. Do you know of instances there in the East Texas field where you have flowing wells within a very short distance of pumping wells?

A. Yes.

108 Q. That occurs?

A. Yes, sir, that occurs.

Q. In many instances throughout the field, does it not?

A. Yes, sir.

Q. Don't you in some cases have flowing wells in areas, brought in in areas which were generally considered to have gone to water, areas where there could be no more oil produced?

A. That condition might exist, but I never heard of it.

Q. Well, on the west side of the field haven't wells been drilled where other wells have been plugged and abandoned, and you have gotten wells flowing oil from them because of the existence of these lenses in there?

A. I don't think the lenses probably had anything to do with it. I think in the early days you drilled a lot of wells into the water, and by virtue of lack of experience they let them drown themselves out, and you couldn't plug them back, and other people have gone in and drilled a well, just barely touched the top of the sand, and are skimming it off the top, and those wells are producing.

Q. What would you do about those wells that are just barely making their allowables now, would you have them plugged in?

A. Not unless they are making excessive water. If they are making excessive water I think they are creating waste, it is creating waste to let them produce.

Q. Now, do you know how the porosity of the East Texas sands are calculated, do you know what the porosity is?

109 A. I have heard estimates made on it, yes, sir. I never made any test on the sands myself, or I never had any tests made, any laboratory tests made, but I have heard that tests have been made and heard what the figures were.

Q. Do you know how much variation there is in porosity between different tracts there or different areas in the field?

A. It varies some, yes, sir.

Q. How much does it vary?

A. Oh, I would say it varied as much as, maybe—

Mr. Moody:

Your Honor, the witness obviously doesn't know.

The Witness:

It is just a guess.

Mr. Moody:

He testified all he knew was what he heard people say.

Mr. Hart:

You offered him as an expert.

Mr. Moody:

Yes, sir, but he is not an expert in all things, and we have engineers here.

The Court:

Isn't this evidence more or less negative? Haven't you witnesses of your own to testify to those matters, and who will testify affirmatively instead of fishing around with this witness, instead of getting this evidence which isn't very convincing?

Mr. Hart:

As I understand, Your Honor, they offered him as an expert.

The Court:

I know that.

110 Mr. Hart:

If he will say "I don't know", that is all I want.

The Witness:

I said I don't know as a matter of fact.

The Court:

There is, of course, the rule that on cross examination you ought to develop only those matters which were gone into on the original examination. Now, if you want to depart from the original examination to prove up independent matters of your own, then if you find the witness doesn't know about it his evidence is negative. I would quit him and make my proof by witnesses that knew, your own witnesses. You are sounding him out on a great many matters that they didn't ask him about.

Mr. Hart:

I understood, if the Court please, that he had offered a formula here which is summarized in this sheet here, and I was trying to find out what factors were taken into consideration.

Mr. Tilley:

He said an engineer prepared it.

The Witness:

That is right, the engineer prepared it.

The Court:

How long have we had this witness on the stand? He has been on almost all day. I have been going right along with you without making much complaint because I felt that the first two or three witnesses would break the back of the case, but we can't afford to take too much time.

Mr. Hart:

I will try to hurry along as well as I can. I don't know whether they are going to put on any witnesses to substantiate this schedule, and for that reason I want to know if he knows anything about it.

111 The Court:  
All right.

Q. Mr. Rowan, do you know what factors ought to be taken into consideration in trying to arrive at the reserves, the oil reserves under a tract.

A. Well, I will tell you how I have always estimated mine, and I haven't estimated them like an engineer would estimate them, but I think they are fairly accurate. I had experience—

Q. Excuse me just a minute. Name the different factors you take into consideration in determining the amount of recoverable oil under a tract?

A. Acre feet of sand thickness, in the East Texas field.

Q. All right, that is one.

A. That is a factor that I would use.

Q. Is that all?

A. And I would multiply it by 800 barrels, and when I say acre feet I mean Woodbine area.

Q. Are those the only factors you would take into consideration?

A. Yes, sir; in making my own estimates that is all I took into consideration.

Q. Is that the method you are proposing to the Commission?

A. No, sir, that is not necessarily the method I am proposing to the Commission.

Q. What are you proposing?

Mr. Moody:

It is immaterial what he is proposing. He is proposing that the order as enforced by the Railroad Commission confiscates his property.

The Court:

I think so.

112 Mr. Hart:

I submit that where the Commission tries to work out a fair method he can't come in and say "I am not going to give you any help. I admit that potentials reflect these things, but I am not going to tell you how to do it better", and then get an injunction.

Mr. Moody:

He misunderstands the witness' testimony. He doesn't say that, and we don't want to appear as being in the attitude, Your Honor, as saying "your order is wrong and we are not willing to help you." We have been at it, Mr. Rowan testifies, for five years. We don't want to take that attitude at all, or have it appear that we are not willing to try to help arrive at a more equitable plan, but we take it that the effort to attempt to discuss those things here is futile. The Commission has to find its own way of writing an equitable order.

The Court:

I think it is very much like a rate suit. The Court can't make a rate, but the Court can enjoin a rate. I can't make a new one.

Mr. Hart:

If the Court please, in a rate case the company has to come in and show the Court the facts with reference to it, and indicate what would be a fair rate.



The Court:

When you get down to a legal proposition, isn't about all you are doing with the witness is arguing with him?

Mr. Hart:

I am trying to find out, if the Court please, what his method of proration would be.

113 The Court:

He is not the Commission, he doesn't have to make an order, all he has to do is pass on the one they make. If it suits him, all right. If it doesn't, he can file suit.

Mr. Pollard:

If the Court please, I think they are showing there is no more fair or reasonable way that he knows of than the present.

The Court:

That is a matter of argument, isn't it?

Mr. Pollard:

No, it is a matter of fact in how they can reach that allocation, Your Honor.

The Court:

Well, I don't fancy the way you put it up to him. You ask him to tell you how he would do it. I don't think he has to do that. I don't think he has to do that at this hearing.

Mr. Hart:

What I meant to say was what method was he proposing. He has proposed a method by his petition in this case. He says "You ought to allocate the total allowable in the same proportion that the reserves" under his

tract, the reserves of recoverable oil under his tract, bear to the whole field. I want to find out if there is any more accurate way of determining that, than by taking potential tests.

The Court:

You can do that, but don't put him in the attitude of where he has to furnish the handle. You are just arguing about nothing here. You can ask him about the facts if you don't keep on insisting he give you another schedule.

114 Mr. Moody:

Your Honor, let me say this, it might create the wrong impression on the Court's mind, since the pleadings—I think Mr. Hart misconstrues the pleading. The rule of property rights as now declared by the Courts is that his right is to produce in that proportion which the amount of oil underneath his land bears to the total recoverable oil in the common pool. It is merely a pleading of his right and not a proposing of a matter to obtain the enjoyment of that right, but merely a pleading that the present rule doesn't permit him to enjoy that right.

The Court:

Go ahead.

Mr. Hart:

Would the Court consider this a fair question, what fairer scheme would there be of allocating a potential—allocating the allowable other than on a potential basis?

The Court:

If you want to ask him that, all right.

Mr. Tilley:

We will object to it, if the Court please. It is a conclusion on his part.

Mr. Hart:

He is being offered as an expert.

Mr. Moody:

He is not an expert on railroad commission.

The Court:

They cross examined him, and he says their method is unfair. I don't think the burden rests on him to dig up some new method, but if he happens to dig up one he can say so.

Q. Mr. Rowan, do you know of any fairer method, or one that takes into consideration less factors that are unknown?

A. I think there are three or four methods that could be used that would be fairer than the one you are using now.

Q. What are those?

115 A. I think you could take a method based on acre feet of sand thickness with a correction factor for bottom hole pressure and it would be fairer than the one you are using now, and it would tend to possibly prevent waste more than the one does now. I think there are other plans that you could use that would be fairer than the one you are using now.

Q. What are they?

A. You could take acreage times potential and it would be fairer than the one you use now.

Q. All right, what else?

A. Well, I don't have any in mind right now, but I expect you could use some kind of factor for bottom hole pressure—I said acre feet of sand thickness with corrections for bottom hole pressure, didn't I, at first?

Q. I think so.

A. You could take acre feet of sand thickness with corrections for potential, and that would be fairer than the one you are using now.

Mr. Hart:

Now, is it the ruling of the Court that we cannot go into the question of whether the method he has proposed is fairer, whether his methods are fairer?

The Court:

You can argue it out with him if you want to. I will give you broad latitude in cross examining him.

Q. You spoke of a factor based on sand thickness and bottom hole pressure?

A. Yes, sir.

116 Q. Would you just take the total sand thickness, disregarding any differences in porosity, permeability or the character of the sand?

A. That is correct.

Q. Or the amount of the connate water in the sand?

A. That is correct.

Q. You would disregard all of those differences?

A. I would in my plan. The Commission could regard them if they wanted to. And I think it would make it a lot more scientific and accurate, but to make it so the average man out there could understand it that owns the lease, I would disregard them. I don't think you would do a lot of inequity if you disregarded them.

Q. Did the potential method disregard porosity and permeability in determining the character of the sand?

A. I don't think it has a lot to do with porosity; probably it takes into consideration permeability. It doesn't indicate the drainage area around the well.

Q. It indicates permeability?

A. Yes, sir.

Q. Also an indication of bottom hole pressure, which is another factor you consider?

A. I think it is an indication of bottom hole pressure to an extent, but it leaves out one thing I think necessary in any order, in order to give consideration to property rights, and that is that it doesn't take into consideration the amount of oil that a man owns in place. I think there are three dimensions you have to have to that.

117 That is length and breadth and depth. I don't think a man can produce oil until he has it there. In other words, if you drilled on top of the Sabine Uplift and you got a dry hole the hole wouldn't do you any good. You have to have sand, and measure the drainage area to compensate for the oil reserves you have in place.

Q. The thickness of the sand doesn't help unless it is saturated with oil, does it?

A. No.

Q. Being non-porous and non-permeable and saturated to a considerable extent with connate water and filled with lenses, if it is like that you don't have a recoverable oil under there?

A. No, sir. I think they ought to take into consideration,—as I said, I think it would make it much more complicated than to take the known Woodbrine section and use that on an acre foot basis.

Q. You mean it would be impracticable to determine all of those factors that you are speaking of, determine them exactly?

A. I don't think it is impracticable. I think you would have to have quite a force just like you would if you take the potentials on every well in the field at one time. I think by this latter method you could get all the information you wanted, but it would be a pretty big job.

Q. Now, Mr. Rowan, you testified as to what your original reserve under your tract was. What did you say that was?

A. We estimated a million and some odd  
118 thousand barrels. 1,506,000 barrels, wasn't it?

Q. How much per acre foot?

A. Oh, this particular estimate wasn't made by me, it was made by my engineer.

Q. Well, now, Mr. Rowan, do you mean to say you are not vouching for that, you don't know anything about it, you are just quoting the engineer?

A. Yes, sir. The estimates I made are higher than the one he made, and we used his lower estimates, and he makes estimates on the basis of ultra conservatism.

Q. How much recoverable oil is there under your lease?

A. Now or in the beginning?

Q. In the beginning.

A. In the beginning we estimated 1,506,000.

Q. That much per acre?

A. No, sir, not per acre. I don't have the figure per acre.

Q. Let's get that. That is what you alleged.

The Court:

He had twenty-four and a fraction acres; that is just arithmetic. Is there any difference in the tracts?

The Witness:

No, sir. My estimate was 70,000 barrels per acre. This is going to run about 60,000 barrels, the schedule I put in the record this morning is going to run about 60,000. Like I say, it is slightly lower than the estimates I made.



Q. When you were testifying at Fort Worth in the case up there in 1933 you estimated 45,000 or 50,000 barrels per acre?

A. Correct.

119 Q. Now you say how many?

A. Now I say 70,000.

Q. 70,000?

A. Yes, sir.

Q. Trying to determine those reserves and allocations on that basis is a pretty uncertain way of allocating?

A. I don't think so. We have developed a lot of information on the field today we didn't have then during that period of time. Then we didn't know whether the allowable was going to be a million barrels or three hundred thousand, or what. I think the rate of withdrawal is going to have something to do with the recovery you get per acre foot.

Q. Did that have anything to do with the oil in place?

A. Originally?

Q. Yes.

A. Yes, it had something to do with the oil in place, the recoverable oils; the oils are there, and the recoverable oils depend on the method in which you produce it. I assume that restricted rates of flow are a conservation measure. And the reason they restrict them is because ultimately there is a greater recovery. If you open the flow wide you would probably have lesser recovery than under restricted flow. And at the Fort Worth hearing we didn't know the rates of production or flow.

Q. All right, but what was your estimate of the original oil in place under your tract?

A. 45,000.

Q. 45,000 barrels?

120

A. Yes, sir.

Mr. Moody:

Does it say recoverable there—you have your testimony there—was it recoverable or just oil in place?

Mr. Hart:

I am talking about the recoverable oil originally in place.

A. My estimate at Fort Worth was 45,000 per acre, 45,000 barrels per acre.

Q. You now estimate 70,000?

A. That would be my estimate. My engineer's estimate is 60,000.

Q. What is that due to, Mr. Rowan?

A. I think we have more information on the field than we had then, and we have a lot more information as to the way the field is going to be handled, that is, the rates of production, the rate it is going to be taken out, and all of those factors. You have a lot more information to base an accurate estimate on now than you had then. I think most engineers have changed their opinions.

Q. In other words, those estimates include variable factors which would cause inaccuracies in a method of allocation which would depend on determining the amount of reserves in place on any tract?

A. The amount of recoverable reserves, yes sir, but not the amount of reserves.

Q. How much recoverable in place under your tract do you think you have now?

A. We estimate 1,151,168.

Q. How much oil has been taken out, then,  
121 355,254 barrels?

A. Yes, sir, 355,254 barrels.

Q. You have taken that out?

A. Yes, sir.

Q. You mean there is that much less oil in place under your tract than there was originally?

A. Do I mean there is any voids down there?

Q. No, sir. What did you say?

A. Voids.

The Court:

He asked, you if you had taken out that much oil.

A. Yes, sir, I have taken out that much oil.

Q. How much oil is in place under there now? Is there that much less oil actually in place now than there was at the beginning of production of your lease?

A. I imagine so, unless I have drained it from somebody else.

Q. Haven't you drained from other people so that you have practically the same amount under your tract as you had at first?

A. I don't think so.

Mr. Moody:

You mean recoverable oil?

Mr. Hart:

Yes, sir.

A. I don't think so, no, sir.

Q. What has taken the place of all this oil you drained out from under your tract?

A. Oil has taken the place of it.

Q. Other oil has taken the place of it?

A. Yes, sir.

Q. Then, you have under your place at this time practically the same amount of oil you had under there at the time you drilled your well?

A. No, sir, I don't think I have the same amount of oil that I had then. I think the oil is there, but the pressure, it takes pressure to get oil to the surface.

Q. How much is the pressure on your tract at this time?

A. I don't know, Mr. Hart. We haven't run any—you understand, we don't have any engineer working for us. No pressure bombs have been run. We asked the Railroad Commission for contour maps, and we are willing to stand on them. I think the pressure contour maps put out by the Commission are accurate.

Q. You don't know the pressure on your lease?

A. No, sir.

Q. They are flowing wells, though?

A. Yes, sir.

Q. How long do you think they will continue to flow?

A. Well, I don't know. That is a pretty hard thing to figure, there are so many variable factors in there you would have to take into consideration.

Q. Assuming conditions remain like they are now, how long do you think the wells will flow?

A. Possibly five years.

Q. And about how long do you think the wells will continue to pump after that?

A. I don't know. We estimated the life of the field, if they continued to produce as much oil as they are producing now, as fourteen years.

Q. Now, Mr. Rowan, you say you got just  
123 as much oil, that you have just as much oil in place under there as you had when you drilled your first well?

A. I think that is right, yes, sir. I don't say I have as much recoverable oil.

Q. You say you haven't got as much recoverable oil?

A. Yes, sir.

Q. Do you mind telling me why you think there is not as much recoverable oil under there as when you drilled your first well?

Mr. Moody:

He has answered that, if the Court please. It is repetition.

Mr. Hart:

I don't think he has.

The Court:

I thought he said the pressure was lower.

The Witness:

That is it exactly.

Q. Is pressure the only factor you are considering there?

A. That is all, yes, sir, that is the only factor I am considering.

Q. There is not any water under your lease now, is there?

A. I don't think so. The information we have is that there isn't.

Q. The reduction in pressure is the only factor you think reduces your recovery of oil by that much?

A. Yes.

The Court:

At what bottom hole pressure did that come in at?

The Witness:

About 1600 pounds, Your Honor.

Q. How much is it on your tract, about 1150 pounds?

A. I believe so, Mr. Hart. I would be willing to take the Railroad Commission's statement on that. Like I say, we don't have any pressure bombs, and they measure them in key wells,

and I think their information is all right, I don't question that, and if it shows 1100 I think that is all right.

Q. The wells will continue to flow until you get down to about what pressure?

A. Well, all I have is hearsay information, and that is on the east edge there, I think about 700 pounds bottom hole pressure, 700 or 800 pounds. About 800 pounds, I guess.

Q. Do you know how many pounds the pressure is being reduced per year under the present withdrawal from the whole field?

A. No, sir.

Q. Isn't it something like twenty-five pounds a year?

The Court:

Counsel, it seems to me you ought to get that from witnesses who know it. Make it affirmative rather than negative.

The Witness:

147,000,000 barrels produced, and I was under the impression the pressure dropped about one pound or eight-tenths of a pound per million barrels.

The Court:

Why not get that from somebody that knows. You have engineers that know, haven't you?

Mr. Hart:

I think we have.

The Court:

Let's not have the record loaded up with "I think" or "I guess".



Mr. Hart:

I have asked him these questions because he has testified about them very broadly, and I wanted to know if he really knew anything about it. Of course,  
 125 if he doesn't know I don't want to press the matter any further.

(At this time a short recess was taken, at the conclusion of which the following proceedings were had:)

Q. Mr. Rowan, I believe you stated toward the beginning of your testimony that you agreed with the restriction of the field as a whole to a certain total allowable because it helped preserve the pressure?

A. Yes, sir.

Q. And under the present amount of withdrawal as permitted by the Railroad Commission there has been a very slow decline in the bottom hole pressure, is that correct?

A. Substantially so, yes, sir.

Q. Isn't it correct within the last year on your lease the bottom hole pressure has dropped only about eight pounds?

A. I don't know, Mr. Hart, I really don't. I would be willing to accept the Railroad Commission's figures on that.

The Court:

That is repetition.

Mr. Hart:

Sir?

The Court:

I say that is the fourth time we have that in the record. He is willing to take your figures on it. I

wouldn't ask him that anymore. I don't want to hurry you, Counsel, but I think I have been indulgent.

Mr. Hart:

I have asked him about different things, and that is the reply he has made.

The Court:

That is the only thing he has offered to take your word on:

126 Q. Assuming that the drop has been about eight pounds per year, how long, then, would it be before the pressure on your lease became so low your wells ceased to flow?

A. I could figure it out. You said it was 1100?

Q. About 1125?

A. 1125, and I believe the wells go to pumping at 800. That is 325, and I can divide eight into that, eight into 325, and I get—

Q. Something over forty years?

A. Yes, sir.

Q. Before your pressure would be so low that your tract would have to go on the pump?

A: Yes, sir.

Q. Then, after your tract went on the pump there would be a certain time in which you could pump oil, is that correct?

A. According to that calculation, yes, sir.

Q. So that the drop in pressure has not affected very much the amount of recoverable oil under your tract?

A: Affected me?

Q. Yes, sir.

A. I think it has affected me some. This statement I put in the record, I think, showed the time element is affecting us quite a bit, too.

Q. You mean because you are allowed to recover only a small amount at one time that the spread of the time that you are allowed to recover amounts to confiscation of your property, that is your contention?

A. No, sir. It looks to me like this chart that I put in here indicates that long before we have exhausted our reserves under our tract the field will be completely depleted.

Q. Doesn't that chart or schedule that you submitted to the Court assume that all of the wells in the field will go out of production at the same time, that the whole field will go out of production at the same time?

A. No, sir, it doesn't assume that. The only thing it assumes is that the rate of withdrawal from my lease will be the same hereafter as it is now, and the rate of withdrawals from the field will be the same.

Q. That won't be true as to the whole field. Won't there be a lot of wells shut in around the edges of the field before your wells are shut down, and won't your wells operate for a much longer period than nearly any other area in the field?

A. I don't think so, more than any other area in the field. Of course, there are some wells on the west that are going to go to water and be abandoned.

Q. At the present time, Mr. Rowan, you know it to be a fact, don't you, that wells are being abandoned on the west and east side and northern and southern edges?

A. I think on the northern and southern and west wells are being abandoned, and I think, possibly, on the east side a few wells drilled on the extreme eastern limits in, you might say, a kind of sandy section in there. I don't know of any wells that have been abandoned on the east side that have had as much as ten feet of sand to begin with. Possibly they have.

Q. Isn't there a large area on the eastern side that is already on the pump?

A. Yes, sir.

Q. And isn't it true that the sands on that side  
128 of the field are tight so that the east side of the field will go out of production a long time before the wells in the center of the field around your tract will go out of production?

A. No, sir, I don't think so, if your bottom hole pressures are holding like they are now. I think in that particular Gladewater area if what you have indicated is true, I believe that those wells on the east will be flowing as long as mine.

Q. You don't think the contrary is indicated by the fact that there are so many pumping wells on the east and the pressure on the east is so low at this time?

A. I say there are some pumping wells on the extreme eastern edge, but I don't know whether those wells are in an area where you have good sand, something like ten feet of good sand. There are wells drilled on the extreme east edge that don't have very much sand, and I think those wells have gone on the pump.

Q. Now, Mr. Rowan, you testified about Mr. Wood getting a permit. You protested against that permit, did you not?

A. Yes, sir.

Q. And carried it through the Courts and the Courts upheld Mr. Wood's permit, did they not?

A. Yes, sir.

Q. When you made—

A. They upheld the Railroad Commission to grant it. I guess that is upholding his permit.

Q. I didn't quite understand you.

A. I say they upheld the right of the Railroad Commission to grant the permit. I guess that is up-  
129 holding his permit.

Q. When you protested the granting of the permit, you, at that time, through your counsel, threatened the Commission that you would file a suit of this kind, did you not?

A. I don't know whether I did or not.

Q. Let me read you—Mr. Tilley was representing you at that time, wasn't he?

A. Yes, sir.

Q. Let me read you part of his letter, "if the permit is granted this protestant will unquestionably litigate this question and again start litigation which will help no one, but will create confusion and probably result in injurious consequences to independent operators who, like the applicant, have drilled wells in good faith and have not subdivided." That is what your counsel wrote the Commission at the time he was protesting the granting of the Wood permit?

A. I don't know. I haven't seen that letter.

Q. Would you like to see it (passing paper to witness).

Mr. Tilley:

May I read the letter with him, Your Honor?

The Court:

Yes.

A. Well, it isn't signed. I don't know whether Mr. Tilley wrote it or not. He is here, and he can say whether he wrote or not. I never saw the letter, I can say that positively.

Mr. Tilley:

It sounds mighty like I wrote it, Mr. Hart. I am willing to admit it.

Mr. Hart:

We offer in evidence the letter, offering the last sentence in the last paragraph of that letter.

130 Mr. Tilley:

We object to that, if the Court please, because I think the letter is immaterial and irrelevant.

The Court:

Sustain the objection.

Mr. Hart:

If the Court please, I offer the letter for the purpose of showing that the purpose of the suit as brought by Mr. Rowan is not in order to attack the proration order, but is because he was peeved at the Commission for granting the permit to Mr. Wood on an adjoining tract.

The Court:

He says he doesn't know anything about it, he didn't write the letter. There is no information in there that he furnished to Mr. Tilley, apparently, that would bind him in any way.

Mr. Hart:

It is a part of the record before the Commission.

The Court:

That doesn't have any probative force at all in this case.

Mr. Hart:

Note the exception.

The Court:

We have a lot to try out without trying out those kind of things.



## Re-Direct Examination.

Questions by Mr. Tilley:

Q. Mr. Rowan, does it make any difference how much oil you have under your land if you can't recover that ratably?

A. I don't just exactly understand that, Mr. Tilley.

Q. Well, for instance, Mr. Rowan, suppose you have the same amount of oil now that you had originally, but the Railroad Commission would shut in all  
131 of your wells. Now, they would say, "Mr. Rowan, you have that much oil, but we are going to let you produce that ten years from now."

A. No; I would be in worse shape than I am in now.

Q. All right, under open flow conditions what would be your advantage with reference to the time of production of your oil?

A. The advantage would be with my wells in the middle of the field, the Fairway.

Q. You would have every advantage, then?

A. Yes, sir.

Q. Then, if the Railroad Commission delays you in the production of your oil, then the time element constitutes confiscation of your property?

A. Yes, sir.

Q. All right. Now, if under the present plan of production, Mr. Rowan, you can not get that proportion of the oil which is equivalent to that under your land before the water gets you or before all the reserves are gone; then in that way will you suffer confiscation or not?

The Court:

Counsel, it seems to me that your question is leading.

Mr. Tilley:

Rather, Judge. I withdraw it.

Q. Mr. Rowan, does it make any difference about how many wells you have over there on your tract or on the tract next to you as to how much oil underlays your tract? For instance, take an area of eight times the area of your lease and close in every well on those adjoining  
132 leases except one to each twenty acre tract or each ten acre tract, what would be the effect of the recovery of your oil if there were drilled outside of that area which is eight times the area of your lease wells to a great density?

A. I think I would suffer drainage.

Q. Then, the question as to the density of the adjacent leases to you bears no reasonable relation to your recovery under your lease?

A. No, sir.

Q. Mr. Hart asked you whether or not you have changed your position about whether or not you contended back there in 1931 and 1932 that you wanted to drill more wells so you could recover more oil: What was your contention at that time?

A. Well, I have always had the same contention, so far as I knew.

Q. What was it?

A. That is, that I was entitled to recover the equivalent of the amount of oil that I had under my leases.

Q. Now, I read you from the same application filed by your attorney, which does not bear your signature, of October 8th, 1932—does it bear your signature?

A. No, sir.

Mr. Hart:

If the Court is going to rule that none of that is admissible—

The Court:

I don't see that it has anything to do with the case.

Mr. Moody:

Do you withdraw your offer?

133 Mr. Hart:

I don't withdraw anything.

Mr. Tilley:

He interrogated him without my objection on this other statement. Now, in explaining his statement in that instrument—

The Court:

Is it that letter which you are supposed to have written?

Mr. Tilley:

No; this is the application which was filed for more permits, in October, 1932, and which Mr. Hart called the attention of the witness to the fact that he was asking, his counsel was asking for more wells because he would be entitled to recover more oil. I now propose to show—and then he asked him if he has changed his position, I now propose to ask him whether or not in that same application, whoever wrote this application on behalf of him, didn't also say "and that we will thereby be assured of the oil underlying our leases at this time."

Mr. Hart:

If the Court please, both of these are in the form of briefs, the arguments that were submitted by counsel representing Mr. Rowan in those various cases.

The Court:

I think we made a mistake to ever let them get in evidence. I don't think it has anything to do with the case.

Mr. Tilley:

I think so, but, since he has injected it, I wanted to make that explanation.

The Court:

Two wrongs don't make a right.

Mr. Tilley:

I will refrain or desist right now, Your Honor.

134 Q. Now, have you seen a sand map of the Railroad Commission's? Does it have a sand contour map?

A. I understand they have a sand contour map.

Q. Well, have you been to proration hearings and seen that map?

A. I don't remember of ever seeing one at a proration hearing, although one might have been exhibited.

Q. Do you know Mr. J. S. Hudnall over here, a witness for the Railroad Commission?

A. Yes, sir.

Q. Have you seen his sand thickness map?

A. Yes, sir.

Q. Have you ever heard anyone seriously question the accuracy of that sand thickness map?

A. No, sir.

Q. Do you know whether or not practically every major oil company in Texas has such a map?

A. I think they do. I haven't seen them. They usually make them up on the field.

The Court:

Counsel, this evidence isn't worth anything.

Mr. Mahon:

Your Honor, we object to this witness being allowed to testify further, and ask that his previous testimony in

which he admits hearsay be stricken. He says he doesn't know. His testimony couldn't serve any useful purpose.

Mr. Tilley:

We withdraw it.

Mr. Hart:

Will the Court pass on the motion just made to strike his testimony?

The Court:

No, I am not going to strike it.

135 Mr. Hart:

Note the exception.

Q. Now, Mr. Hart in interrogating you interrogated you in regard to variations in sand thickness maps that would be prepared. Mr. Rowan, I will ask you whether or not there were variations on the potential map that the Railroad Commission took?

A. Yes, sir, there is variations on it.

Q. All right, do you know whether or not when they get such variations they consider those potentials, whether they considered them or threw them out?

A. They have thrown out certain potentials, yes, sir.

Q. Now, would the variations with reference to sand thickness be any more pronounced than they were with reference to potentials, the way the Railroad Commission took them?

A. I don't think it would be so pronounced.

Q. Mr. Hart asked you this morning as to whether or not you had appeared recently, Mr. Rowan, before the Railroad Commission, or within the last few years, to protest the present plan of proration and ask that the Commission adjust the allowables over there or promulgate a plan based on recoverable reserves under each

man's lease. Will you testify more fully in reference to that, and testify whether or not others have done the same thing for the last few years?

A. I appeared at two special hearings on my own application for an adjustment this past year, in 1938, and then I appeared at two statewide hearings.

Q. I am talking about since the rendition of the opinion in Brown versus Humble?

A. Yes, sir, I have appeared before the Railroad Commission.

Q. Who was there also and spoke to the Railroad Commission and protested?

A. Who spoke to the Railroad Commission and protested?

Q. Yes.

The Court:

Counsel, what has that to do with it?

Mr. Tilley:

Well, if the Court please, he has just by implication tried to impeach the testimony of this witness.

The Court:

What difference does that make who was there?

Mr. Tilley:

It shows that if they think he wasn't telling the truth he can be called to the stand.

The Court:

~~You haven't a jury here.~~ The Court is interested in this order, not all this crimination and recrimination.

Q. Mr. Rowan, you testified that your estimates of the recoverable oil under your lease have changed somewhat now from what they were originally. Can you



testify as to whether or not quite a large number of competent engineers have also likewise changed their opinions and estimates?

A. I think so, yes, sir, in the past few years we have given the field a higher recovery, and I think the Railroad Commission itself has even done that.

Q. Mr. Hart interrogated you about whether or not these wells have paid themselves out. Has Mr. Wood's well produced enough oil under his allowable to  
137 have already paid out that well?

A. I don't know how much oil he has produced. His allowable has been; if he has produced it every day according to the schedule, it has been practically enough to pay the well out.

Q. Has he already produced as much oil as was originally under his lease?

A. Assuming he has a tenth of an acre, I think he has, yes, sir.

Q. He has?

A. I think so.

Mr. Hart:

We object to that. There is no evidence to show he had a tenth of an acre, and the permit gives him a well on an acre tract.

Mr. Moody:

Your Honor, let's straighten that out. I was in that business from the time it started. Mr. Wood comes to the Railroad Commission and applies for a permit on a one acre tract of land, or what he represents to be a one acre tract of land. The Railroad Commission can't try the title or get into a controversy over the number of acres in the tract. It is his representation that he has a one acre tract of land, but I think Mr. Hart does the record in that case an injustice to say it is an acre, or that we may do it an injustice to say it was a tenth. It was merely represented

to the Railroad Commission as an acre, and it is a matter that is not inquired into.

138      The Court:  
            What is the materiality of it?

Mr. Moody:  
    I don't think there is anything material about it.

The Court:  
    Why take the time?

Mr. Moody:  
    It just keeps going in here that it is an acre tract.

Mr. Tilley:  
    And there is another thing I don't think is material. I don't want to go into that. And that is this question as to what Mr. Rowan said was the minimum allowable that should be given under his plan.

The Court:  
    Why don't you all finish with this witness? If you go into all that Mr. Hart will have to examine him on it.

Mr. Tilley:  
    Not if I ask him on the same matter Mr. Hart examined him on. I think it purely argumentative.

139      (Witness Excused).

E. O. BUCK, a witness for Complainant, having been first duly sworn, testified as follows:

## Direct Examination.

Questions by Mr. Moody:

Q. State your name, please, sir.

A. E. O. Buck, B-u-c-k.

Q. Where do you live, Mr. Buck?

A. Houston, Texas.

Q. What is your business?

A. I am a consulting petroleum engineer and geologist.

Q. Mr. Buck, please state, sir, your education and training?

A. I am a graduate from Texas A. & M. College, class of 1926, with a major degree in geology and a minor in petroleum engineering.

Q. Mr. Buck, after you graduated from college, did you start at once into the petroleum engineering work?

A. It was more of the geological phase, Mr. Moody. I was employed by the Gulf Petroleum Company, or Gulf Production Company, as geologist and transferred to the Laredo district. I worked in that area from the summer of 1926 until February of 1927 when I was transferred to the Ft. Worth division and continued on in that capacity as geologist until the fall of 1928, and was then transferred to the Yates Pool in Pecos County; from there to the Wink field in Winkler County, and then to the Panhandle. I severed my relationship with the Gulf Company in the summer of 1931. And during the time that I was spending in all of those oil fields I was in the capacity of a petroleum engineer.

Q. Now, you started out working for them in geological work and finally got into petroleum engineering work?

A. That is correct.

Q. Now when you left the Gulf Company in  
140 July, you say, 1931?

A. Yes, sir.

Q. For whom did you then go to work?

A. I went to work for the Atlantic Pipeline and surveyed a pipeline from Beaumont to Kilgore, Texas.

Q. How long were you with the Atlantic Pipeline Company?

A. From somewhere around the 1st of July until August 17, 1931.

Q. Then whom did you go to work for?

A. Well, I wasn't employed at that time, and the martial law was on in the East Texas Field, and so I took off for a couple of weeks and went back to the field and went to work for the railroad commission.

Q. When did you go to work for the railroad commission?

A. September 19, 1931.

Q. What work and what field or fields were you assigned to by the railroad commission?

A. I was petroleum engineer for the railroad commission in the East Texas Field, and after about March of 1932 I was promoted to resident engineer, which job I held until I left the commission in April of 1933.

Q. That is, you were resident engineer in the East Texas Field?

A. Yes, sir, in charge of the engineering department.

Q. Did you work under Mr. Dennie Parker here who was then supervisor of the Oil and Gas Division of the railroad commission.

A. Yes, sir.

Q. Now, Mr. Buck, since you left the employment of the railroad commission have you been in the private practice as a consulting engineer or have you been working for some of the oil companies?

141 A. When I first left the railroad commission, in April 1933, I took a job as technical advisor for the Conroe Operators Association and advised with them on the development and operation of the Conroe field. I held that position until the summer of 1935, and asked them then for an opportunity to devote part of my time to

a consulting practice, which they granted. And in the summer of 1936 I left their employment entirely, and since that time have devoted my entire time to the consulting practice.

Q. And maintaining your home in Houston?

A. Yes, sir.

Q. And office?

A. Yes, sir.

Q. Now, beginning—what is your first contact, then, with the East Texas oil field? Was it in September, 1932?

A. No, sir.

Q. September, 1931?

A. No, sir. As I explained, I surveyed this pipe line from Beaumont up to Kilgore and that was between July and August, 1931. At that same time, just prior to the martial law shut down, why, we were running in a lot of gravity pipe lines and so forth in the field along there tying in with the main lines. So I was generally familiar with the conditions there in the field prior to going to work for the railroad commission.

Q. But from September, 1931, to April, 1933, you were continuously in that oil field as an employee, as a petroleum engineer employed by the Railroad Commission of Texas?

A. That is correct.

142 Q. Did your duties require you to devote all of your attention to some particular part of the field or did your duties involve bringing you in contact with all parts of the East Texas field as it was then in the process of development?

A. The duties of my office, Mr. Moody, were to make a general study of the field. As you recall, the railroad commission had very few regulations when they took over the field in 1931. In September they took over the duties of administering the regulation of that field from an oil proration group which was called the Texas Central Proration Committee, I believe something like

that, and the railroad commission had very few, if any, rules and regulations. And our first duties upon going in there in September of 1931 was to study the field and write such rules and regulations as would call for an orderly development and proper completion of the wells in the field, and particularly with the spacing of the wells in that field. The first assignment that I had in the East Texas oil field was to unitize that field on twenty acre units and fractions thereof for spacing of the wells in the East Texas field.

Q. Was that the first drilling plan that the railroad commission had in the East Texas field? That is, after they went to undertaking to handle it was to drill it in twenty acre units and allow each fellow a well on every twenty acre unit or fraction thereof?

A. Yes, sir.

Q. Was that later changed by changing Rule 37?

A. Here is what happened in there, the old Central Proration Committee had adopted a twenty acre spacing also, but they permitted ten acre locations. In  
143 other words, you cut your tract into a twenty acre tract, but they gave you a 336.60 location, which is in effect a ten-acre spacing. The railroad commission continued with that and there was quite a bit of controversy about it, and they changed that and went back to 150-300 foot location for awhile. I believe it was later proved that there was a period in there that they didn't have any spacing rule and then when that was called to their attention, why, they got that straightened out and they went back on ten acre spacing, as I recall, and that rule is still in effect.

Q. Do you recall how many wells there were in the East Texas field when you first went there?

A. Yes, sir, when I was there—I don't know when I first went there, but I know at the time of the martial law shut down, August 17, 1931, there were approximately 1,765 wells in the East Texas oil field.



Q. Do you remember approximately how many wells there were in the East Texas oil field when you severed your connection with the railroad commission, a matter of a year and seven months later, I guess. April of 1933, is that it?

A. Yes, sir.

Q. Do you remember how many there were then?

A. Roughly twelve thousand wells; right in the neighborhood of twelve thousand wells.

Q. Now, in the time you were in that field as employee of the railroad commission did you examine many or few well logs?

A. Mr. Moody, when I first went there and we got the unitized twenty acre spacing map made, the next important problem over there was to try to determine the water level in that field.

144 The Court:

You are not answering his questions. We can get along so much faster if you will listen to what he asks you. He asked you if you had examined many or few well logs. You can answer that "many" or "few".

A. Yes, sir, I did.

Q. Many of them, what?

A. Many of them.

Q. Now, what duties did you perform, if any, with reference to locating the water table in that field?

A. We passed a rule at that time in the East Texas field that a well could not penetrate into the sand deeper than two-thirds of the sand thickness above the water table, and the operators immediately came back and said "Where is the water table?" So the onus was then on the commission to try to establish this, and I spent a considerable amount of time with my associates working with the drilling wells up and down the west side of the field, examining the cores and drillers' logs and all of the

company records that were available to me in determining what this original water table was so we would have a penetration factor we could give the operators that were drilling in that western side of the field.

Q. All right. Now, then, did the performance of that particular work make it necessary that you study well logs and well cores?

A. Yes, sir.

Q. Did you study many of the well cores?

A. Yes, sir.

Q. Many?

145 A. Yes, sir, I studied every core that was made available to me, and I am sure that by the summer of 1932 that I had examined over 500 individual cores—I mean cores from 500 individual wells in that field.

Q. Were they just from one part of the field or did the cores involved take in all parts of the field?

A. All parts of the field.

Q. Now, at the time you left the commission in 1933 had the field, the general confines of that field been located? I mean the general limit of it, had they been drilled over, had it been drilled over as far east and out west as far as it runs and north and south? Had they found the thing we know now as four or five miles wide and thirty or forty miles long?

A. Yes, sir, the field had been delimited on all sides.

Q. All right. While you were with the railroad commission, and in connection with your efforts to learn the original water table there, had that study involved any study of the sand thickness in that field?

A. Yes, sir.

Q. Had you made such studies?

A. Yes, sir.

Q. Now, since you left the railroad commission and since you have been in the private practice as a consulting petroleum engineer have your employments called upon you to continue your studies or make further studies of the East Texas field?

A. Yes, sir, I have been back to the East Texas field on occasions no less than four times every year  
146 since I have left there, and in some years more often than that in going back making a study, either appraisal of properties or other matters as to value of properties.

Q. And you have been called on at various times to testify before the railroad commission or Courts or tax commissions with respect to the properties and conditions of the East Texas field?

A. Yes, sir. For a period there after I left the commission every time I got back to Austin someone put me on the witness stand to testify about the East Texas oil field.

Q. Now, Mr. Buck, you have been employed in this case by Rowan & Nichols, the Plaintiff?

A. Yes, sir.

Q. You have been employed as an expert witness?

A. Well, I wouldn't say that I am an expert—

Q. You have been employed as an engineer, I will put it that way?

A. Yes, sir.

Q. And you are here under their employment?

A. Yes, sir.

Q. Now, Mr. Buck, in connection with the problem that is presented by this case, have you in addition to the information that you have accumulated back through the years concerning the East Texas oil field, have you made further studies into the East Texas field?

A. I have.

Q. Have you, as the field has been developed and the railroad commission has been in the business of prorating the field, have you from time to time kept an  
147 account of and informed yourself on the various methods that the railroad commission has adopted in prorating the East Texas field?

A. Yes, sir, I have kept up with that and have attempted to read every publication or recognized authority on conditions in the field.

Q. Now, Mr. Buck, it is my understanding that the present proration plan in the East Texas field is substantially this; that a field allowable of some 520,000—

Mr. Hart:

If the Court please, we wish to object to counsel stating his understanding of that. If they want to prove up the proration scheme they can introduce it.

The Court:

"I would like to hear him state it. Of course, the order itself is what finally controls, but I would like to hear his statement of it. Go ahead.

Q. As I understand—

The Court:

You are not bound by his statement.

Mr. Moody:

No, sir.

Mr. Hart:

I object to it being in evidence and being binding on us.

The Court:

The order itself controls.

Q. As I understand, the present proration plan involves a field allowable of approximately 522,000 barrels of oil per day. That is the allowable production allotted to the field. The commission then allows to all wells that will make twenty barrels or less than twenty barrels—allows to all wells twenty barrels of oil per well. Some of the wells will not make twenty barrels, and the difference

between what they can make and the twenty barrels is then allotted on a basis of well potentials to wells in the field that can make more than twenty barrels and that the potential basis or the potential factor that they use in the plan of proration is arrived at by periodically taking well potentials under controlled conditions in certain key wells throughout the field, perhaps some 100 or so wells, and then in that manner they allocate the 522,000 barrels of allowable oil from the field amongst the several wells in the field, and the 522,000 barrels, as I understand, is a figure that is determined upon the basis of market demand and also what quantity can be produced without reducing the bottom hole pressure to that point which will result in the creation of physical waste. I have stated my understanding of it. I will ask you if that is not a correct statement of it, and if not, indicate wherein it is incorrect and make a correct statement of the plan.

A. That is substantially correct. The plan, the original potential tests were taken in April of 1933, and at that time, as I recall, some seventy-five key wells were taken. The total top allowable for the field, was placed or determined by the commission and then an allowance for marginal wells, or as they call any well that could not be produced below twenty barrels, if it was capable of producing that many, was divided into the total potential as taken by the railroad commission in potential tests of these wells and a factor was determined then—the way this thing works out they give every well that is capable of making it twenty barrels and then they multiply that well's potential factor and in that way increase the allowable on some of the wells up to as high as twenty-five barrels. If a well can't make more on a potential test than 800 barrels an hour it receives the same twenty barrels as one that is a twenty barrel pumper, but if the well is capable of producing above 800 barrels a well and up to the top potential of

1,100 barrels per hour then the distribution is made. It works virtually to this effect, that 97% of the allowable is distributed on a per well basis and 3% of the allowable is allocated among the wells that are capable of producing above 800 barrels an hour. That is virtually what the order does.

Q. Well, now, you heard some figure here of two decimal some odd per cent of the well potential. How does that—how is that figure used in allocating the allowable production amongst the wells?

A. I don't know if this is an exact statement of it or not because I haven't checked those figures in some time, but usually they take the hourly potential of the well, and its portion of the hourly potential of the field, and they determine this potential factor and then they give the well its twenty barrels and multiply that potential factor by what is remaining there to distribute. You see, as more wells come in naturally that spread between the thousand barrel well and 800 barrel well is decreased. At one time it was more than five barrels. Now the spread is five barrels, or approximately five barrels.

Q. Well, now, under this present plan of proration is every well that is incapable of making more than twenty barrels of oil per day allowed that quantity of oil which it can make up to the twenty barrels? Let me state that question again: does the present plan allow to every well that cannot make more than twenty barrels per day, does it allow to such well twenty barrels if it can make it or whatever under twenty it can make?

A. Yes, sir, whatever the well will pump. They usually give it a several day pumping test and whatever it will make, and average over several days period, that is the average up to twenty barrels.

Q. Now, how many wells are there—the railroad commission puts out, does it not, a schedule that they call



the proration schedule, in which they list all of the wells in the field and all of the—

Mr. Moody:

Your Honor, I am not going to introduce this in evidence, there is too much of it, but so the idea may be before the Court, the railroad commission monthly puts out a thing of this kind that gives the names of the wells and the leases and the amount of oil allowed to each particular well, is that right?

A. Yes, sir, this schedule—

Q. Proration schedule—

A. Shows the company, the lease, survey and county in which the well is located, and the number of the well and its potential, and then in either the front or the back of the schedule they have a key system that you can look up the potential that is shown out beside the well and see what your allowable would be.

Q. All right. Now, then, have you made a study of this last proration schedule issued by the railroad commission?

A. Yes, sir.

Q. How many wells in that field, as reflected by that last proration schedule promulgated by the commission—first, I will ask you when was this last schedule promulgated?

A. The last schedule that I have seen is as of January 1, 1939.

151 Q. All right. Now, then, how many wells are shown by that schedule to be in that field at this time that will not make twenty barrels of oil per day?

A. I believe it is 468 wells.

Q. Those 468 wells, do you know how much oil they actually produce?

A. It is somewhere above 5,000 barrels. I don't know just exactly what the figure is. I didn't finish my calculations on it. It was furnished to me but I don't remember it.

Q. All right. Now, then, the wells that can produce more than twenty barrels of oil per day are started off, as I understand, with twenty barrels?

A. Yes, sir.

Q. All right. Now, then, there are 25,900 producing wells in that field at this time, are there not?

A. My last check on it was 25,910 wells.

Q. All right, at twenty barrels per well, 25,900, would be 518,000, wouldn't it?

A. Yes, sir.

Q. Then, that leaves 4,000 barrels of oil, plus whatever this 468 will lack of making twenty barrels apiece, to be prorated amongst the wells on the potential factor, is that right?

A. Yes, sir.

Q. Do you know how many barrels of the total 522,000 daily allowable to the field is prorated on the potential factor?

A. Slightly less than 14,000 barrels.

Q. What per cent of the daily allowable of the field is allocated to wells upon the basis of the potential factor that the commission determines by taking the potential of these key wells?

A. Between two and a half and three per cent.

Q. That would mean, then, between ninety-  
152 seven and ninety-seven and a half is allocated on a per well basis?

A. That is correct.

Q. Now, is that the practical application of the present order that the commission is enforcing in the East Texas field?

A. Yes, sir, that is the way it is being enforced.

Q. Now, does that order take into account or does either the order in its terms, and we will introduce that order, your Honor, does the order in its terms or does the application of the order in the East Texas field take into account the acreage in any lease, and I mean surface area when I say acreage?

A. No, sir, it does not.

Q. Does that proration order or plan take into account any question of oil reserves under any particular lease?

A. It does not.

Q. All right. Now, in the practical working of that order, assuming that—well, I will ask it this way: do you know of any instance in the East Texas field where one tract of land drilled to a density of one well to say five acres and an adjoining tract of land is drilled to a density of one well to one acre, do you know of any such instances as that?

A. Yes, sir, I think you can find on the maps many instances like that.

Q. Many instances. Now, then, assuming that the Wood tract here has an area of one acre—that is the figure Mr. Hart has been using—then the tract we have been talking about here in the case, the Rowan & Nichols tract, does that furnish just such an example?

A. Yes, sir.

Q. You know of other examples?

153. A. Yes, sir. Remember, since the last time I checked it there have been additional wells drilled on the tract. That would change that. But I have seen numerous examples of that.

Q. Now, then, assuming that the Wood well and the Rowan & Nichols wells had been drilled with the same size bit and to the same depth in the sand and had been completed in the same manner and used the same sort of equipment in completing the wells drilled right there together, would you—is your experience in the East Texas oil field such that you would be able to give us an opinion as to whether or not the two tracts would likely have the same potential, the Wood well and one off setting it, would likely have the same potential?

A. Yes, they would have practically the same potential under the conditions you have demonstrated.

Q. Now, then, let's assume that they do have the same potentials. As this order is now being enforced in the East Texas oil field, what amount of oil is the plaintiff in this case, Rowan & Nichols, allowed to produce daily per acre off their lease, and what amount of oil is Mr. Wood allowed to produce daily, per acre, off his lease?

A. I believe in figures Mr. Rowan recovers slightly in excess of four barrels per acre per day and Mr. Wood would recover or be allowed to produce slightly in excess of twenty-two barrels per acre per day under the conditions that you have given me.

Q. In other words, the production on the small tract would be roughly 500% when you translate it into production per acre?

A. Yes, sir.

Q. 500 per cent of what the Rowan & Nichols  
154 tract is allowed to produce?

A. Yes, sir.

Q. Now, in the application of such an order as the one now being enforced by the railroad commission, is what has been shown by this illustration, is that true in many places in the field?

A. Yes, that is true all over the field where there is any difference in the spacing of any one well as compared to another within the same contour line.

Q. You know of wells over there being drilled on considerably less than half an acre, do you not?

A. Yes, sir.

Q. Now, then, such a well producing, if it could produce more than twenty barrels per day, that is, if it can get the benefit of a part of this three per cent that is allocated to potential, and if it is offsetting another tract of land that is drilled to a density of one well to ten acres, then the well—the well on the tenth of an acre tract will produce approximately a hundred times as much per acre per day as the well that is drilled on the ten acre tract, will it not?

A. That is correct.

Q. Is there anything in the order that undertakes to take into consideration the fact that one man owning a tenth of an acre here or a half of an acre here, and owning that from the center of the earth to the dome of the heavens and adjoining a man who owned a tract say of five acres with one well on it, and owning from the center of the earth to the dome of the heavens, is there anything in the order that attempts to make any adjustment between this man with one well on five  
155 acres and the adjoining man on a half acre or tenth of an acre?

A. The only adjustment that is made there would be that slight adjustment if the two tracts had different potential values.

Q. All right.

A. As far as the reserve is concerned or what he might own under his land, there is no attempt in this order to satisfy one land owner against another.

Q. All right. Now, I will go into that later on, into the question as to how much of a test this potential factor is, but now I will ask you this question: in your opinion, where one man has a tract of five acres or a tract of five acres with one well drilled on it, and the adjoining man has a tract of a tenth of an acre or half an acre with one well drilled on it—

A. Yes, sir.

Q. Would the difference that might exist in potentials between those wells take account of the fact that one man had so many more times as much surface and so many times more area in his sands, would the potential factor take, adjust that thing so that each one would be under this order allowed to produce his proportionate part of the oil in place?

A. No, sir, it would not, and the order never attempted that, has never attempted that.

Q. Now, I asked you if this order took into account surface acreage and you said it did not. Does it take into account sand thickness under a lease?

A. No, sir.

Q. Now, let's get to this question of potentials. I want you to describe to the Court how those potentials  
156 are taken. By the way, do you have one of those potential maps of the railroad commission here with you?

A. No, sir. I have asked for one and we had one borrowed, but I haven't seen it.

Q. I want you to describe to the Court how these potentials are taken and about the key wells and how these contour lines are run and how it is determined, how the commission attempts to determine by taking these potentials of a few wells the potentials of 25,000 wells.

A. The first potential test that was made in the East Texas field was made in April of 1933. After I had left the commission the commission borrowed me back from the people that I was working for to come back there and assist in the selection of these wells and the starting of the potential order. At that time, if I remember correctly, we picked some sixty-seven wells to start a potential test on, and we naturally picked key wells right down the center of the oil field. We did that for several reasons. One was we knew we could produce those wells at open capacity without any apparent damage to the wells or the surrounding property if we didn't do that over too long a period of time. So we were very careful as to their location as key wells. Also, it was necessary to select wells that had sufficient sized casings in them to produce this quantity of oil. It was also necessary that the wells be equipped with large flow lines, and that the tanks were located in close proximity to the well that we were testing. As I recall, we tested first sixty-three wells scattered up and down and as near as possible right down the center of the oil field. And out of that sixty-



157 seven or sixty-eight wells there were three or four of them that something went wrong. They would have maybe a nine hundred or thousand barrel potential area there and there would be a well in the middle of it only producing 600 barrels, so I never at any time since the beginning of potentials thought anything of them as a measure of anything except the amount of oil that a well might produce. So we would throw these wells out and hunt around in that neighborhood there until we could find another one that would come up to somewhere where we expected it to produce. I think on the first test that was completed we had seventy-five or seventy-six wells taken as key wells for the potentials. We then contoured the field on lines of equal pressure, I mean equal production, or made a potential contour map. Naturally, as we had avoided—we avoided getting too close to the west edge of the field because sudden, rapid production of a well over there might cause it to produce water. It was necessary then to even space our contour from our last point of control over to the western edge, and as we were contouring in hundred barrel contours, we just equal spaced it. If we were a mile from the west edge we divided that mile into five equal parts and we stepped down from a potential of 500 barrels an hour to zero barrels just in even steps, and likewise that same condition was done on the east side of the field. We were not afraid of bringing into the wells water. Most of the wells on the east side were either small wells or pumping wells or equipped with small flow lines. You couldn't get the operators, they weren't willing to put their wells up as saying they would be representative of that territory in there, so likewise on the east side of the field from our last point of control, anywhere from a half

158 to three-quarters to a mile from the eastern extremity of the field we also even spaced the contour in there, so by throwing out what freak wells that we couldn't account for, we finally made the first potential

map. There was a loud howl and protest and complaint and any number of operators said their wells were better than that, and one or two wells that were drilling at the time that this potential order was put in specifically completed their wells so they would make a high potential, and the commission granted them an opportunity to produce a potential test. So they have added to this thing now, and as I understand there is in excess of a hundred wells now that are on this potential schedule. Some of them were taken during the shut down period of the first two weeks of April of 1933 and some of them were taken after the field had been opened up and was producing again, but those potential wells after they were established and accepted, all wells that fall in that contour line fall within the potential range as set out by the railroad commission unless the operator protests, and if he does they let him go out and take a potential test.

Q. Well, now, do you think that that system of testing a few wells and undertaking to draw contour lines from them is an accurate way of classifying wells in that field with respect to the potential of the well?

A. Well, in respect to the potential of a well, naturally the more wells that you would take potential tests on, why, the more nearly you would approach the true potential condition of your field, whatever the potential means. I have never satisfied my mind that the potential is representative of anything except possibly a slight indication of the permeability of a sand and the mechanical efficiency of a well to produce oil.

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Q. All right. Now, that leads to this question: what is, in your opinion, or what will be indicated by a potential test and what will have to do, what will determine whether that potential is high or low, please, sir?

A. The two or three factors that control whether that potential would be high or low would be the permeability of the sand, the mechanical condition in which the well is completed, such as the size of the casing and the flow

lines, the close proximity of the tank, the amount of back pressure that the well was flowed on or the mechanical hook-up of the well plus the reservoir pressure at the well.

Q. That is, if I understand you right, it is permeability and the mechanical equipment of the well—

A. Yes, sir.

Q. Mechanical completion and equipment of the well—

A. Yes, sir.

Q. And pressure. Those things all have to do with the potential of the well?

A. Yes, sir.

Q. Now, then, does the potential tell you anything about—which is the best way to find out about the bottom hole pressure, by trying to take a potential or running a pressure bomb down in the well?

A. It is lots more positive, and cheaper too, to take the bottom hole pressure.

Q. All right, is the potential any fair test of bottom hole pressure or an accurate test?

A. No, because there are so many other factors  
160 that could be influencing the production of that well other than pressure.

Q. So the only thing that a potential test will tell with respect to the formation from which the well is drilled is the permeability?

A. Yes. Of course, we have this factor—I made use of the word permeability there. You could have a varying permeability in there, but—and also a varying sand penetration, and get the same results. In other words, if you have less permeability and greater penetration or the other way around you would get the same results if the well was mechanically completed the same and the bottom hole pressure was the same. There are so many variable factors in there that I don't see how it could represent anything.

Q. How much would it cost to take the bottom hole pressure, approximately, if you know, in the East Texas field?

A. Well, there are services hired for that at \$100 a day, and a good operator can take anywhere from four to seven pressures a day.

Q. How much would it cost, approximately, to take the potential of a well in the East Texas oil field?

A. It just depends, Mr. Moody, on what the conditions are. Out of the 25,000 wells over there that they could take a potential on, we—at the time I was in there it was 12,000 wells that we wanted to take potentials on and we were having difficulties in selecting one hundred of them that were mechanically equipped to take potentials on. Now, some of the operators volunteered to go in and change their well hook-ups and rearrange their lease facilities to accommodate us for taking those tests, and the cost there on changing that could vary anywhere from \$100.00 to \$1000.00, depending on what they might have to do in changing the well hook-up.

The Court:

Counsel, what is the materiality of that?

Mr. Moody:

I don't think it is particularly material.

Q. Mr. Buck, will the potential tests of one well and an adjoining well be an accurate measure of the capacity of those two wells to produce unless both wells were drilled into the sand to the same depth and at the same bore and completed in identically the same manner, and unless the potential is taken under exactly the same circumstances with respect to equipment and back pressure maintained on the well during the time the test is taken?

A. The further stipulation that the pressure on the two wells be the same. Then the two potentials would reflect, otherwise they wouldn't.

Q. The relative capacity of the wells to produce?

A. Yes, sir.

Q. Are all wells in the East Texas field drilled in the same way, take in the same amount of sand, all drilled to the same size, all equipped in the same way and to the same depth of sand, or do they vary in those respects?

A. As a general it varies by operators. Each operator has an idea about how to complete a well, and as many operators as you have, you have that many different types of completion.

Q. Insofar as potentials are taken in the East Texas field, in your opinion, do those potentials do anything more than show the capacity of the particular well the potential is taken on to produce oil?

A. That is all it means to me.

Q. Does it have any relation to the capacity of a well a quarter of a mile from there or 300 yards from 162' there to produce oil?

A. I see no particular bearing it could have on anything.

Q. Now, you stated that the potential test might reflect something about permeability. I want you to explain to the Court about permeability—and since those terms are some times confused amongst us in our conversation, also explain to the Court the difference between permeability as you petroleum engineers discuss it and porosity as you use that term.

A. For a substance to have permeability it must necessarily have porosity, but it doesn't always follow—the two terms are not the same, and in some instances we have substances that have porosity but have no permeability. I might put it this way: if we divided this Court room with a partition into two equal halves. I can fill one-half of this Court room with basket balls and I can fill the other side of this Court room with number eight BB shots, and they would each have the same porosity, but the permeability of the room that had the basket balls in it would

be many, many times greater than the one that had the BB shots. The permeability is a measure of the ease, or the resistance, rather, resistance to flow of fluids or liquids or gases through a porous medium. Now, naturally, if you take a room that is full of basket balls and have this big space in between each ball it is very easy for the liquid in there to move from one big void space to another and get out, whereas in the other side of the room where it is full of BB shot, the movement of that liquid through there would be subject to many more frictional obstructions and the permeability of that would be far less than the permeability of the other room. So when

163 we speak of permeability we are talking about the ease with which something can pass through, and the porosity means the amount of void space or pore space or open spaces between the sand grains.

Q. All right. Now, in your illustration there if you divide this Court room into two halves and fill one end with basket balls and the other with BB shot or bird shot you say that the porosity would be the same?

A. Yes, sir.

Q. You mean by that that the voids in the room where the basket balls were would be just the same as the voids in the room that was filled with BB shot?

A. Yes, sir, the cubical content of the void space would be identical.

Q. That is on the theory that where you have round things of that kind, all of uniform size, that three-fourths of the space is taken up by the round things?

A. Yes, sir.

Q. And one-fourth of the space is not taken up, whether you use number eight bird shot, BB shot, or basket balls?

A. That one-fourth there as an approximation of twenty-five per cent porosity there.

Q. The relative spacing there is the same?

A. Identical.



Q. Where the openings are larger there you have the greater permeability though you may not have a greater porosity?

A. You have identical porosity, but considerable greater permeability.

Q. In your opinion does the potential factor tell anything or reflect anything about the porosity of the sand?

A. No, sir, it doesn't indicate anything about  
164 the porosity at all.

Q. All right, does the porosity have anything to do with the amount of oil reserves in a particular acre foot of sand?

A. It has all to do with it.

Q. All right. Now, then, in your opinion the potential test doesn't tell anything about the porosity, though it may reflect something about the permeability?

A. That is correct.

Q. Now, in the matter of estimating oil reserves, what factors do you take into consideration, Mr. Buck?

A. In the estimation of oil reserves you are naturally concerned primarily with the cubical content of the property which you have under investigation, that is, the cubical content of the sand. That would concern the porosity and its per cent of saturation, what it is saturated with, the nature and type of the product that is saturated in there, the gravity of the oil, the amount of gas in the oil, the pressure of that formation and the physical aspects as to the nature of the force that moves the oil through the sand, whether it be water pressure or gas pressure or a combination of both, and the structural position of that particular property. Those factors would naturally have to be taken into effect before you could give an appraisal of the property.

Q. Now, taking in the East Texas Field, particularly in this area where the—I will change my question, please, Mr. Reporter. Taking the East Texas Field, have the studies been sufficient there to form what are regarded by

165 petroleum engineers and oil operators as accurate estimates of oil reserves?

A. Yes, sir, I think so.

Q. Now, then, with respect to that part of the field in which Mr. Foran—Mr. Rowan and Nichols' lease is located, is there information available from which estimates of oil reserves in that part of the field can be made, within that range that would be regarded by petroleum engineers and oil operators as accurate estimates?

A. Yes, sir.

Q. You say you would take into consideration the sand thickness?

A. Acre feet of sand.

Q. Acre feet of sand?

A. Yes, sir.

Q. That would mean the surface area? You would project that down and that would give you two dimensions, and then you would get thickness of sand that that would give you acre feet of sand?

A. Yes, sir.

Q. You would also have to know the porosity of the sand?

A. Yes, sir.

Q. You would have to know something about the pressure?

A. Yes, sir.

Q. You would have to know whether it was gas in solution, the viscosity of the oil?

A. Yes, sir, and you of course would want to know the—something about the permeability.

Q. Porosity and permeability?

A. That is correct.

166 Q. Now, then, have many or few cores been recovered—you testified about that—have tests been made on the cores recovered from the East Texas Field to determine something about the porosity obtaining in that field?

A. Yes, sir, many of them have.

Q. Do you know what is regarded as the average—if you had a core that was taken from that sand, the Woodbine Section thirty feet of it, where the sand is thirty feet thick, and another one where it was taken from the sand where it was sixty feet thick and another where it was ninety feet thick, do you know what studies have developed as to what would be the average porosity of the several cores?

A. Yes, sir, I have made estimates, what we call a weighted porosity determination of cores from information that has been made available to me, and other engineers studying this problem have also made similar determinations. We find that the average porosity over there is somewhere between twenty-four and twenty-six per cent. I use a factor of twenty-four.

Q. All right, does that make any difference whether you have a core where it is thirty feet thick or sixty feet thick?

A. No. You see, we have a porosity variance over there from around sixteen or eighteen per cent up to as high as thirty-three per cent, and you will find streaks of this tight, less porous sand and then streaks of the porous sand in the same well, so your average weighted variation will run very nearly to twenty-four per cent.

Q. Have they determined what is the average permeability in the East Texas Field?

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A. We don't have as many permeability determinations as we have core determinations, but where we lack in permeability determinations from cores we can determine that from reservoir pressures, so we are equally as well fortified as to permeability determinations; although we don't have our measures in dorsi or millidorsies we have it in pounds of pressure.

Q. It is what is known as a water drive field, is it not?

A. Generally recognized, I believe, by most authorities.

Q. All right. Do you have in the East Texas Field—have investigations determined the top of the sand and the bottom of the sand so that you can determine the average range or average thickness of the sand under any lease in that field?

A. Yes, sir, I made a sand thickness map over there in December of 1932 with less than 10,000 wells to work with.

Q. Now, have pressure studies been made there so that the pressures obtaining in the various parts of the field are well known?

A. Yes, sir. I inaugurated the taking of those pressures and they have come right on down. The railroad commission has monthly pressure checks, plus the monthly pressure checks of the individuals over there. We have more pressure information on the East Texas Field than any other field in the world.

Q. Now, has it been determined in that field what pressure the gas now in solution will pass out of solution and leave the oil thicker and heavier?

A. Yes, sir, it has been actually determined. The Bureau of Mines has done some private work on  
168 that and various bureaus of companies have worked on that problem, and it is generally recognized that the violent point is around 575 pounds.

Q. I believe that covers the various factors you said were to be taken into effect in determining oil reserves in the East Texas Field?

A. Yes, sir.

Q. Then, information is available from which oil reserves in that field can be determined?

A. Yes, sir.

Q. Is that information available to the Railroad Commission of Texas at this time?

A. I am sure that it is.

Q. Now, then, is there any method—is there any factor in the present plan of proration that makes allowance for

the recoverable oil between two tracts that are affected by this proration order?

A. No, sir.

The Court:

I didn't understand that question. Restate it, please.

Q. Is there any factor in the present proration order that makes allowance for the difference between the recoverable oil under two adjoining tracts that are affected by the proration order?

A. And I said "no."

Mr. Moody:

That is what I meant to state the first time.

The Court:

I understand.

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Q. What is your answer?

A. I said "no."

(At this time a recess was taken until 9:30 a. m., February 7, 1939, at which time the following proceedings were had:)

### Direct Examination (Resumed).

Questions by Mr. Moody:

Q. Mr. Buck: yesterday afternoon at the time Court recessed I had asked you, I believe, a question bearing upon whether or not the present plan of proration had any factors that took into account the difference between the oil reserves in two leases that might adjoin, and you had answered that question. Now, with respect to the plaintiff's lease involved in this case, a twenty-five acre tract of land, and in the pleadings there is also mentioned a tract

of land adjoining, referred to as the Wood tract. There is some controversy whether that tract is a one acre tract or one-tenth of an acre tract, apparently. Now, then, is there any factor in the existing plan of proration that is enforced in the East Texas Field that makes any allowance or takes into account in any way the difference between the oil reserves under the Rowan & Nichols twenty-five acre tract and the oil reserves under the Wood tract, whether it be one acre tract or one-tenth of an acre tract?

A. None whatsoever.

Q. Now, the Wood tract is drilled to a density either of one well to a tenth of an acre or one well to one acre, whichever it may be, and the Rowan & Nichols tract is drilled to a density of approximately one well to 170 five acres?

A. Yes, sir.

Q. Now, is there any factor in the existing proration order or in the application of it to the East Texas Oil Field, that takes into account the oil reserves, the respective oil reserves under these two tracts, so as to allow those tracts to produce oil in proportion to the recoverable oils under them, respectively?

A. No, sir.

Q. In your opinion is this order, as enforced, applied and enforced in the field, particularly with respect to the Rowan & Nichols tract and the Wood tract, are those tracts allowed to produce in proportion to their respective reserves?

A. They are not.

Q. Now, we have applied—the questions have now been directed to those two tracts. Through the field generally as the order is applied and enforced—does it take into account the difference between oil reserves in any tracts and allow production in proportion to reserves?

A. None that I know of. I don't believe that it does.



Q. Now, would it be possible to calculate what proportion of the total reserves in the field are under the Wood land?

A. Yes, sir, I believe so.

Q. Would it be possible to calculate what proportion of the total reserves of the field are under the Rowan & Nichols tract?

A. Yes, sir.

Q. So, throughout the field could petroleum engineers, with that degree of accuracy which would be regarded as accurate by engineers and oil operators calculate  
171 the oil reserves under the various leases in the field?

A. Yes, sir.

Q. Now, have you made calculations on the oil reserves under the Rowan & Nichols tract of land?

A. Yes, sir.

Q. Does this order as it is applied and enforced in the field, and particularly with respect to the Rowan & Nichols tract of land, does this order allow production from the Rowan & Nichols tract of land in that proportion that the oil reserves under that tract—well, I will change the question. As the order is applied and enforced in the field, and particularly with respect to the Rowan & Nichols tract of land, is that tract of land allowed the same proportion of the daily allowable granted to the field by the commission that the reserves under the Rowan & Nichols tract bears to the total reserves in the East Texas Field?

A. It does not.

Q. Is the order as applied in the field—applied and enforced in the field, and particularly with respect to the Rowan & Nichols tract of land, does it allow the Rowan & Nichols tract of land to produce along with other tracts around it and away from it in that same proportion—well, I will change the question a little. As the order is enforced and applied in the field, and particularly with

respect to the Rowan & Nichols tract of land, is that tract allowed to produce in the same proportion to its reserves that other tracts in the field are allowed to produce, or is there a difference in the ratio of production in 172 different tracts as compared with the ratio of the reserves of one to the other?

A. There are in every instance differences—

Q. Recoverable reserves I am referring to.

A. In every instance there are differences, depending upon the structural position of the properties and the density of it. Some of the properties are producing less in proportion to their recoverable reserves than the Rowan & Nichols tract; in others they are producing considerable more.

Q. Does the order as it is applied and enforced in the field, and particularly with respect to the Rowan & Nichols tract of land, entitle the owners of leases there or give the owners of leases there an equal opportunity to realize upon the oil reserves, recoverable oil reserves, of their respective leases?

A. No, sir.

Q. Now, yesterday afternoon you stated certain factors that should be taken into consideration in figuring oil reserves, recoverable oil reserves. You stated a number, porosity, permeability, acre feet of sand, and quite a number of other factors. You said, I believe, that each of those were essential to calculating reserves?

A. That is correct.

Q. Will the potential factors, or a determination of the potential on a well or lease, take the place of all those other factors and give you an index to the recoverable reserves on a particular land upon which a potential of well or wells is taken?

A. It will not.

173 Q. Well, in appraising or valuing property for taxing purposes or sale or mortgage or any other purpose is it necessary to estimate recoverable reserves?

A. Yes, sir.

Mr. Hart:

We wish to object to that question as being immaterial and irrelevant to the issues in this case.

The Court:

What is the purpose of the evidence?

Mr. Moody:

The purpose of the evidence is, your Honor, and I don't want to transgress that ruling your Honor made yesterday, I don't want to even have the appearance of it, but the Courts have said up here—I tried to use a moment ago the language of the Courts with reference to equal opportunity, the lease owners being entitled to equal opportunity to produce, and I was undertaking to fortify the testimony that he has given by showing that oil reserves, the value of a lease is its oil reserves, and that there is no way to determine that, the value of a lease, by taking a potential on wells. That is what I had in mind.

The Court:

All right, overrule the objection.

Q. All right.

A. Governor Moody, in any appraisal or valuation estimation that I have ever made, or any engineer in this Court room ever made, they had to go in and consider the factors that I have given you yesterday afternoon, and there are none of us that would have in any way attempted to place a value on a piece of property solely by its potential.

Q. Now, you are talking about potentials as they are taken in the East Texas Field?

174 A. That is correct.

Q. Now, Mr. Buck, has the railroad commission at all times, or do you know whether or not the railroad commission has at any time in its proration orders in

the East Texas Field taken into consideration acre feet of sand or sand thickness?

A. Yes, sir, on one occasion they did.

Q. So the order in that field has—I will go back. Do you know whether or not the railroad commission ever prorated that field or allocated the daily allowable on a strictly per well basis?

A. Yes, sir, they did.

Q. Do you know whether or not they ever allocated it on a bottom hole pressure basis?

A. In part bottom hole pressure they did.

Q. Now, then, you said they have at times, or at one time, allocated it in part upon sand thickness or acre feet of sand under a lease?

A. Yes, sir.

Q. But this order now enforced does not take any of those factors into consideration?

A. No, sir, it does not.

Q. Only potential?

A. That is correct.

Q. Now, Mr. Buck, the existing plan of allocation of allowable of wells in the field, in your opinion is that plan necessary to prevent waste?

A. No, sir, the plan has nothing to do with it so long as the top allowable for the field is maintained.

175 Q. What particular part of the present proration order is directed to the prevention of waste?

A. Only the top allowable of the field.

Q. Explain to the Court why you say that.

A. The top allowable for the field—there is a certain efficient rate of production from the reservoir that the commission or the operators dare not exceed in good operating policy to recover a maximum amount of oil from the reservoir. That they have attempted to do in the placing of the top allowable in the field, now at some 522,000 barrels per day. The distribution of that allowable inside of the field has very little or no connection with

the physical waste properties as the commission is attempting to enforce them.

Q. You mean the proper distribution of that?

A. That is correct.

Q. Now, Mr. Buck, I believe it is in evidence here that under the western edge of the field there is water?

A. Yes, sir.

Q. And that the sand at the eastern edge of the field is thinner than the sand in the center of the field, or in the fairway as it has been called?

A. That is correct.

Q. Then it pinches out to a feathers edge almost over to the east edge, the sand does?

A. The sand pinches out to almost nothing on the east edge. It gets thicker on west, but the oil column pinches to the east the same as the sand to the east, so we have an area of maximum thickness through the center  
176 of the field.

Q. All right. Now, then, assuming that the railroad commission has determined that 522,000 barrels of oil per day is the most efficient way to produce that field and maintain bottom hole pressures and thereby prevent the creation of waste as it is defined by the statute, if that allowable is allocated amongst wells in the field on a per well basis, or largely upon a per well basis, so that wells over in the western edge of the field where there is the oil underlain with water, and so that the wells over in the eastern edge of the field where the pressures are low, and I believe there is testimony here that pressures are lower in the east edge of the field, is that correct?

A. Yes, sir.

Q. Are allowed to produce substantially the same amount of oil per well per day, and considering further the fact that there are spots of dense drilling, as I believe the testimony has shown, through out this field, is such an order as that, or such a distribution of that allowable more or less likely to create waste than a distribution

of the allowable amongst the wells, or allocation of the field allowable among wells upon a basis that takes into consideration acre feet of sand beneath the lease on which the wells are drilled?

A. The present order—that question is a little lengthy and has two or three points to it—the present order permitting densely drilled areas and tracts of less than one acre with several wells on them to produce the same amount of oil as sparsely drilled tracts would have the tendency to create low pressure areas and lead  
177 to physical waste. So long as the top allowable of the field is maintained and the distribution is fairly uniform through there the physical waste factor, if one man loses it the next one gains it, so the ultimate recovery of the field will probably be the same. Densely drilled areas that create low pressure zones do tend toward that physical waste condition.

Q. All right. Now, then, if we just take a cross section of that field, going from west to east, here are wells that are in the sands where the water is pretty close to the top of the sand. A little further on to the east the sand gets thicker, and while there is water under it the water is not quite so close to the top of the sand. A little further east we pass out of the water zone and are in a thick sand, as I understand it?

A. Yes, sir.

Q. Then go on to the east and the sand begins to get thinner and finally tapers on out to where you say you are at the far edge or east edge of the sand. Now, then, going across that cross section, if those wells—if the wells are all allowed to produce, or rather the 522,000 daily field allowable is divided among them on a per well basis, or practically a per well basis, so that the poorest well over at the west—I won't say the poorest, but the well over at the west that can just make twenty barrels is allowed to make twenty barrels and the well in the thickest sand that could make perhaps several thousand barrels



is allowed to make only twenty or twenty-five barrels, and on over to the east where the pressures are lower, 178 a well that can just make twenty barrels is allowed to do that, and that is spread over the entire field—

A. Yes, sir.

Q. Is such a distribution of the allowable among wells calculated or not calculated to cause the wells that are near the water to bring water up into the sand and cause the wells over where the pressures are low to create a low pressure area than would be the case—and thereby lead to waste—than would be the case if the wells or the division of the daily allowable was made amongst the wells and leases on a plan that took into consideration the oil reserves—the recoverable oil reserves under the respective leases on which those wells were located?

A. Plus one additional factor of a pressure adjustment and I would say yes to that question.

Q. All right. Now, then, I believe we had here yesterday testimony to the effect that there was some 21,000 wells in this field—before I get onto that let me ask some other questions, before I leave the subject I was just questioning you on. If the 522,000 barrels daily allowable of this East Texas Field is divided up among the wells and leases in that field upon a plan—can be divided up among the wells and leases in that field upon a plan that takes into consideration the respective—recoverable oil reserves under the various leases in the field without leading to waste?

A. Yes, sir, that can be done.

Q. Can it be done without leading to a fire 179 hazard?

A. Yes, sir.

Q. Now, in connection with that question or that matter let me ask you this: the testimony showed here, I believe, that there was something in the neighborhood of 21,000 or more wells in this field that were allowed to

produce under the existing order only twenty barrels of oil per day?

A. That is right.

Q. Amongst those 21,000 wells, in your opinion, could the wells, could their production, that is wells that can make over twenty barrels of oil per day but now are only allowed to make twenty; could the production of those wells be reduced below twenty barrels per day without damaging the wells and without resulting in a loss of production ultimately recoverable from the field, and without causing the premature abandonment of the wells?

A. I think so.

Q. Now, Mr. Buck, have you made a study of the proration schedule of January 21, 1939?

A. Yes, sir.

Q. Is this the schedule?

A. Yes, sir.

The Court:

Is this the order that is under attack now?

Mr. Moody:

This is the schedule, yes, sir.

A. The schedule.

The Court:

All right.

Q. Now, Mr. Buck, there is a key in that or an index, what do you call it, a scale, in this first page of the schedule?

A. Yes, sir.

180 Q. Now, then, can you tell me from that what pressure—I mean what potential a well has to have before it will be allowed to produce more than twenty barrels of oil per day?

A. Yes, sir, it has to be above 860 barrels per hour.

Q. All right, does that mean that a well that has an hourly potential of one barrel—that would be twenty-four barrels a day, wouldn't it?

A. Yes, sir.

Q. You figure that on a twenty-four hour day?

A. Yes, sir.

Q. Does that mean that a well that has an hourly potential of one barrel—

A. Yes, sir.

Q. And a well that has an hourly potential of 860 barrels—

A. Yes, sir.

Q. That each would be allowed to produce only twenty barrels per day under this present plan of proration as is applied in this field?

A. That is correct.

Q. And that all wells from wells with one barrel potential per hour on up to wells having a potential of 860 barrels per hour are allowed only twenty barrels?

A. Yes, sir, according to this schedule.

Q. The one barrel well is put in the same class, the well with one barrel hourly potential is put in the same class as all wells from there on up as high as those having a potential as high as 860 barrels per hour?

A. Yes, sir.

181 Q. Now, then, I notice up here it says scale 2.32 per cent of hourly potentials. Now, let's see how that figures out, the working of that thing. If you got a well that has an hourly potential of 400 barrels per hour on that schedule it would have 2.32, isn't it?

A. 2.32, yes, sir.

Q. On that basis it would have nine and twenty-eight one hundredths barrels if you just applied the formula of 2.32 per cent of its hourly potential?

A. Something like that. I get 9.3.

Q. All right, but that well is allowed to produce twenty barrels?

A. Yes, sir.

Q. Now, what is your top figure there?

A. 860.

Q. 860. Well, now, if that well is allowed 2.32 per cent of its hourly production how much would it get?

A. Nineteen and a half barrels.

Q. But it is allowed twenty barrels?

A. Yes, sir.

Q. Now, let's take a well that has an hourly potential of 100 barrels per hour.

A. Of course, it would then have 2.32 barrels.

Q. But it would be allowed twenty barrels?

A. Yes, sir.

Q. All right. Now, then—

The Court:

I thought that was made pretty clear yesterday.

182 Mr. Moody:

I don't want to repeat.

The Court:

What is the use of pounding it in so much?

Mr. Moody:

I don't want to repeat, your Honor. I am trying to lead up to the proposition that the 2.32 is not a real factor in the prorating of this field but it is a fictitious factor, that is the end I am trying to reach, and I would like to pursue the question a minute or two further.

The Court:

All right, but I thought it was well brought out yesterday, fully brought out.

Q. Now, Mr. Buck, in the practical results how many wells in that field, or rather in the practical application of this so-called proration or allocation formula, how many wells in the field are actually in their daily allowable are actually affected by the 2.32 per cent or get a benefit of it and how many do not have any benefit of it? That question doesn't state what I want. Change the question. In the practical application of this order to the field how many wells actually in their production get more production by reason of the application of the 2.32 figure?

A. I don't know the exact number of those, Governor Moody. I counted these wells different ways, and I don't remember now the exact number of that tabulation. Around 21,000 of them that were allowed twenty barrels and then there were 463 or 464 or 468 classified as sub-marginal wells and the rest of them were above the 860 barrels per hour.

Q. All right, let's see if this isn't the tabulation. That is the tabulation?

A. Yes, sir.

183 Mr. Moody:

All right. I would like to offer this tabulation in evidence.

Mr. Hart:

Did the witness say he made this calculation from records?

A. Mr. Rowan did, I did not. The work was done in the office from the railroad commission schedule. Mr. Rowan testified yesterday as to the way it was made up, but I did not do the actual picking of the wells out of this schedule.

Mr. Hart:

I have no objection to this if you will have no objection to our using similar information.

Mr. Moody:

No, we have no objection.

(The above referred to tabulation was thereupon received and read in evidence, a copy thereof being attached hereto marked Exhibit 5.)

Mr. Moody:

Now, then, your Honor, I want to correct some figures we got in here yesterday that were not literally accurate.

Q. Are you familiar with the figures shown on that paper?

A. Yes, sir.

Q. Do you know these figures? You participated in the accumulation of this data?

A. Yes, sir.

Q. You and Mr. Rowan worked on this together from this proration figure?

A. Yes, sir, last night.

Q. And you believe these figures to be correct?

A. Yes, sir.

Mr. Hart:

Mr. Moody, I don't think this is accurate either.

184 Mr. Moody:  
Sir?

Mr. Hart:

I don't think this is accurate either.

Mr. Moody:

It may not be accurate, but those are our figures from our investigation of those schedules. We may not have figured it accurately, but we believe it is accurate. Its accuracy has nothing to do with its admissibility.



Mr. Hart: .

This is to correct the figures given yesterday?

Mr. Moody:

Yes, sir.

The Court:

What does it purport to cover?

Mr. Moody:

It purports to cover this: We stated the amount of oil in round figures that actually was divided among the wells on the 2.32 factor to be about 14,000 barrels but upon figuring further we find that that estimate was too high, that it is some, I think, 8,250 odd barrels that is distributed on that factor or approximately 1.61 per cent of the total field allowable of 522,000 barrels per day is distributed among the wells on the 2.32 factor. We offer that.

Mr. Hart:

I have no objection if you agree our witnesses may make similar calculations.

Mr. Moody:

We have no objection.

Mr. Hart:

You will have no objection to those calculations being offered in evidence?

Mr. Moody:

No.

(The above referred to document was thereupon received and read in evidence, a copy thereof being attached hereto marked Exhibit 6.)

Mr. Hart:

May I ask, this is of what date?

Mr. Moody:

Made off the January 1, 1939, schedule.

185 (At this time a recess was taken, at the conclusion of which further direct examination of the witness Buck was had, as follows:)

Questions by Mr. Moody:

Q. Mr. Buck, you see the maps there that have been placed up on the board? The one at the top on the left, will you tell me what that map is, what it purports to show?

A. That is the railroad commission potential map of the East Texas Field.

(Said map identified as Exhibit 7.)

Q. Now, what is the map just beneath it here?

A. The map immediately beneath that is a contour map prepared by me on the top of the Woodbine sand.

Q. Does that mean the contour lines show the top of the Woodbine sand in the East Texas Field?

A. Yes, sir.

(Said map identified as Exhibit 8.)

Q. Now, the map over on the right here, the upper map, what is that, please, sir?

A. That is a water map prepared by me showing the wells making water as of September 1, 1938.

(Said map identified as Exhibit 9.)

Q. And the map down at the lower right?

A. The map at the lower right is a sand thickness map prepared by me.

(Said map identified as Exhibit 10.)

Q. Now, Mr. Back, taking this map, Exhibit 7, I notice on the map certain circles, large circles around wells and figures opposite. For instance, the pointer is now 186 at such a well with the figure 912 opposite it. What does that indicate on this map?

A. That indicates a key well that a potential was taken on, and the potential at the time the well was tested was 912 barrels per hour.

Q. All right. Now, then, the largest figure that I notice here, I see here is at this point 1,003—1,005, down here. It is near Lake Devernian. That indicates that that was a well that had—one of the key wells with a potential of 1005?

A. Yes, sir.

Q. Now, is that the highest potential shown on this map?

A. I haven't examined it for any higher wells. I believe that it is just about as high as any well; there seems to be one on the Humble. I believe that is Kengarrer, I am not sure, with a potential of 1,119 barrels.

Q. It doesn't give the survey?

A. Yes, that is in the Merridith-McCabe Survey.

Q. That is illustrative of what is meant by these various wells with figures around it, the circle indicates the potential was taken and the figure represents the hourly potential as taken by the railroad commission?

A. Yes, sir.

Q. Now, as we get near the west edge of the field I see here on the Humble O. K. Johnson lease, near the town of Gladewater, I notice a key well with the figure 805 and one with 803, two wells close together. Now, in that particular area I don't find any wells that are closer 187 to the west edge of the field. Further down to the south, a well here on the Sinclair-Prairie near the town—in the James Jordon Survey, I find a well with 582 opposite it?

A. Yes, sir.

Q. Now, then, from those two wells how do they project—from such wells how do they project these contour lines out to the west edge of the field?

A. The contouring system as adopted by the state was first to draw a zero line of non-production or zero line of sand thickness around the entire periphery of the production. Zero on the north, south, east and west. Then the wells were taken, such as the well at 582 barrels as you indicated, and the contouring was more or less even spaced between 582 and zero on just an average step-down of 100 barrels decrease at each even step going westward. The same was true in going eastward and north and south from any of the key wells as put on the map.

Q. All right. Now, let's assume that this particular well you have here, 582, the figure 582 opposite it, and another well that was even further to the west than that, if it had been equipped differently and had been drilled into the sand deeper than this 582 well might the allowable in such a well be greater than the 582, although it might fall within some of these contour lines showing an area less than the 582 area?

A. It is entirely possible that there would be wells west of that that would have a higher potential. The operator in most instances would be afraid to take that potential.

188 Q. Now, then, is that generally the way the potentials were determined around the edges of the field?

A. Yes. It is rather difficult to see the main key wells, but if you put a small red circle through the general area showing the outpost wells—the red dots in there now give more or less a picture of the furthest wells westward and the furthest wells eastward that the state used in making their potential map.

Q. I am going to take this well right here that my pencil is on?

A. Yes, sir.

Q. What well is that?

A. We will put it in red so we can identify it.

Q. Call it X well. We can't read the name on the map. Do you see any well between that well and the west edge of the field, and from here to the east edge of the field, over near Joinderville, and to the south of Joinderville, that appears that any potential was taken?

A. No, sir, I do not see any.

Q. Take this well right here. We will call that Y well. Do you see any well on which this map shows a potential was taken from this Y well clear on out to this southwest edge of the field?

A. Southwest?

Q. Southwest edge of the field?

A. No, sir.

Q. Now, Mr. Buck, do you know whether or not—have you had any experience in the East Texas Field that enables you to say whether or not all wells that are shown by this map to lie between these various contour  
189 lines will actually have a potential that would be indicated by the contour lines between which those wells lie?

A. Yes, sir, I have had such experience as that and made such investigation.

Q. All right, tell the Court about it.

A. About six months ago I had occasion to check around 156 wells in the East Texas Field for appraisal, and those wells were lying on the east edge of the East Texas Oil Field, north or immediately around the town of Joinderville, as indicated by the pointer, and going to the north line of the Issac Parker Survey about where I pointed here, I believe.

Q. Let's put the letter A here for Joinderville and the letter B for the approximate north line of the Issac Parker Survey.

Mr. Hart:

If the Court please, we wish to object to this line of testimony for the reason that the area that he is now asking about is some considerable distance, approximately twenty-five miles I would say, from the Rowan & Nichols lease, perhaps farther than that, and this evidence doesn't tend to show in any manner how Rowan & Nichols may be affected by any error that occurred down in that part of the field.

The Court:

What do you say, counsel?

Mr. Moody:

I think, your Honor, the testimony is admissible as bearing upon the general accuracy of the plan. The fairness of the whole plan is under attack. We are showing that it affects us directly and supporting that by general testimony that the plan has that general effect.

190 The Court:

It might be that the plan is valid generally and not valid as to your particular client.

Mr. Moody:

Yes, sir, but I think the testimony that it was an inaccurate plan would support our contention that it was invalid as to us.

The Court:

Overrule the objection.

Mr. Hart:

Note our exception.

Q. What does your investigation of the 156 wells disclose?



A. The 156 wells lay in the portion of the field as indicated between the red A and the red B, and the majority of them were between the 100 and 200 barrel contour and the rest of them were between the 100 and the zero barrel contour, and none of the 156 wells, that is not one single one of them, was capable of making twenty barrels per day on the pump.

Q. Now, do you know whether or not—I will put it this way: Is there any machinery made with which a well that has to be pumped, any machine with which you can pump 300 barrels a day out of those wells?

A. Not from those depths and actually pumping. There are many wells you can agitate and get that much, but not pumping.

Q. Do you know whether there are many or few wells actually on the pump in the East Texas Field, shown on that map to be in or between the 200 and 300 potential contour line?

A. Yes, sir.

Q. Can you pump 300 barrels an hour out of any well?

A. Not that I know of.

Q. With any available pumping equipment in the East Texas Field?

A. I have never seen any pumping equipment in the East Texas Field that had a capacity of 300 barrels an hour.

Q. Do you know whether or not there are few or many wells in the East Texas Field that are now on the pump but which are shown on the potential contour map to be between the 200 and 300 barrel contour lines?

A. Yes, sir, there are many such wells. I have checked them through the area from Joinderville to the Issac Parker and also from Kilgore north and have found that many, many a pumping well is in that area that will pump twenty barrels or slightly more, but there are still many that were not capable of pumping twenty barrels per hour.

Q. But are still shown to be between the two and three hundred contour lines on that map?

A. Yes, sir.

Q. All right. Now, explain the map—we have now been talking about Plaintiff's Exhibit 7?

A. Yes, sir.

Q. Now, explain Plaintiff's Exhibit 8 and tell how that map is made.

A. Plaintiff's Exhibit No. 8 is a contour map on the top of the Woodbine sand from as much well data as I could obtain. When I left the commission in 1933 I had the well data and maps on some 12,000 wells. After that time I checked as many additional wells as I could, and had made available to me many additional well records, and this contour map is based upon the point of depth where the Woodbine Sand Section was encountered at the base of the Austin Chalk, and subtracting the well elevation from that depth to get the sub-sea elevation.

192 The map is contoured on a twenty foot interval, and goes from minus 3,320 feet to approximately 3,140 or 3,120 feet up structure.

Q. All right. Now, with that map can you determine with reasonable accuracy the top of the Woodbine sand under any particular lease in the East Texas Field?

A. Yes, sir, the control of datum points in the East Texas Field is of such magnitude in proportion at this time that it is almost impossible to conceive of any condition within this field that couldn't with very reasonable accuracy—that you couldn't with very reasonable accuracy forecast where a well would hit the top of the Woodbine sand before it was drilled.

Q. Now, is information such as that map discloses and such information as from which the map was made, is that available to the railroad commission?

A. Yes, sir, this type of information is. There has been many publications on it. There has been very free exchange of this type of information, so much so that I

think that practically any one in Texas so interested could obtain such information as to construct such a map of the East Texas Field as this.

Q. Take Exhibit 9 and explain to the Court how that map is made and the data used in the making of that map.

A. Plaintiff's Exhibit No. 9 is a water map of the East Texas Field. The heavy black line as indicated on the west is the minus 3,320 contour line, as indicated on the contour map.

Q. That is as indicated on Exhibit 8?

A. Exhibit 8, yes, sir. The area shaded in light green on the west of the minus 3,320 foot contour line 193-- indicates that all of the area outside of the minus 3,300 was the non-producing west edge area of the East Texas Field. Any wells drilled on the outside of that line, with one or two rare exceptions, were water wells when they were completed. The wells inside of it or eastward of the black, heavy line, and associated in a light blue and indicated by a small brown circle, are wells that either were drilled into the water at the beginning of the field or water encroachment has approached to those wells and they are now producing water, as of September 1, 1938, as far as I could determine.

Q. Well, then, does that map show that part that is—does Plaintiff's Exhibit 9 show that part of the East Texas Field into which water has encroached since the field was brought in?

A. Of course, Counsel, you realize that there is quite an extensive area underneath the field where the water has advanced to. This map only shows those wells that are making water, or the area in which water has encroached to the producing wells, as indicated on the surface. It has no bearing on how much the water line has advanced underneath the field, but every well that has made water has been checked in that rough line to indicate the advance of water since the beginning.

Q. All right. Now, explain Plaintiff's Exhibit 9—10, to the Court, and tell the Court the data or information which that was made from.

A. Plaintiff's Exhibit 10 is a sand thickness map of the East Texas Field. It was made up by a construction of three other maps, and the Exhibit No. 10 is a composite map of those three maps, beginning with a surface contour map, I mean a top of sand contour map, the limits of the Woodbine sand and the water area, at first from zero to possibly 3,200 feet was placed on the map, very similar to the contour map of the East Texas Field.

Mr. Tilley:

Refer to that by exhibit, Mr. Buck.

A. As Exhibit No. 8. I then had occasion to study some 450 Schlumberger logs that had either penetrated the entire Woodbine section into the Georgetown or penetrated the Woodbine section down to the water or had penetrated into the Woodbine section and given me some indication of the sand thickness by those wells, the red dots indicated in triangle, squares and circles are so shown on the map from north to south.

Q. What is the difference between the wells shown with a red triangle around them?

A. The red triangle indicates a well that was drilled through the entire Woodbine section from the top—I mean from the base of the Austin chalk to the Georgetown lime, and a Schlumberger run on there and given the entire sand section, shale section, and everything about the producing horizon of the East Texas Field. The ones shown by a square are wells that were drilled from the top of the Woodbine section and later went into water and were abandoned, were quit when they went into water, and a Schlumberger was run to give us the entire sand section between the top of the sand and the water table. The

wells that have a real small circle with a symbol to the side of them just showed the maximum penetration of that particular well and offer some control as to sand conditions. In the preparation of that map some 195 460 Schlumberger logs were studied.

Q. Now, do you have those Schlumberger logs here with you?

A. Yes, sir.

Q. And subject to examination by the defendant's counsel?

A. Yes, sir. With the Schlumberger logs that have penetrated the entire Woodbine section I constructed a top of Georgetown lime map very similar to the contour map that is shown in Exhibit 8, and with the Georgetown limestone map underneath the contour map and a check on the farthest east advance of the water I made a sand thickness map. This is just an isopach showing lines of equal thickness between the two maps that I have prepared and the contours on the map are in contours of twenty feet where the highest area of closure is 100 feet of Woodbine section, and the ~~second~~ highest area of closure is eighty feet of Woodbine section.

Q. What is the red line I see running down through the map?

A. The red line that extends from north to south on the sand thickness map is a line that I call the zero line of maximum recovery. All wells lying to the west of this red line, under the present plan of proration, are having oil pushed up-structure and removed from their property, and they recover less than that oil which was originally in place.

Q. Now, is that under the present plan of proration?

A. Yes, sir.

Q. All right.

A. All of the wells and leases that lie to the east side of the red line indicated as a zero line of maximum recovery recover more oil than they have in place.

196 Q. Is that under the present plan of proration?

A. Yes, sir.

Q. Now, I want you from this map—from this map can you tell the approximate sand thickness of any lease in the East Texas Field?

A. Yes, sir.

Q. Find the Rowan & Nichols twenty-five acre lease we have been talking about.

A. The Rowan & Nichols twenty-four point ninety-five acre lease, the Todd B lease, is now indicated as the red lease on the map.

Q. All right, what is the sand thickness on that lease, under that lease?

A. The closest contour to the Rowan & Nichols lease is the 100 foot sand thickness contour that goes just immediately west of the west line of the Rowan & Nichols lease. The next contour, the eighty foot contour, is on to the east, and by interpolation you could say that the western part of the Rowan & Nichols lease had from 95 up to 98 feet of Woodbine section and the eastern half had from 95 down to approximately 93 feet, or an average of 95 feet of Woodbine section under that lease.

Q. All right. Now, is that lease east of your so-called zero line? That is, is it a lease which, under the present plan of proration, will recover less than the amount of recoverable oil under it, or is it one of those leases which, under the present plan of proration, will recover more than the amount of recoverable oil under it?

A. The lease lies west of the zero line of maximum recovery, and under the present plan of proration will lose oil up-structure to its more fortunately located neighbor and will not be able to recover that amount of oil in place, or of recoverable oil that was in place under its land.

197 Q. All right. Do you think that condition or result could be corrected, or that condition would be corrected by some different plan of allocating allowable production among wells in the East Texas Field?



A. Yes, sir.

Q. Could it be corrected without creating waste?

A. Yes, sir.

Q. Now, have you made a cross section of that field near the place where the Rowan & Nichols lease is located?

A. Yes, I have prepared a cross section as indicated by a light green line marked A-A that runs between the Rowan & Nichols A lease and the Rowan & Nichols B lease and goes from a west to east direction across the entire field.

Q. All right, let's make those letters in red so they can be seen a little better, if you don't mind, please, sir (marking on map). All right, now, the line of cross section shown by the red line, that runs in an easterly and westerly direction across the field?

A. Yes, sir.

Mr. Moody:

Let me see that cross section map, please.

Mr. Hart:

Did the witness say he prepared this himself?

Q. Did you prepare this yourself?

A. I did not do the drafting on it. I placed  
198 the wells that are on there and penciled it on  
there and then employed a professional drafts-  
man to do it, because I am not very neat with a pen and  
ink.

Mr. Hart:

All right.

A. But I prepared the exhibit, yes, sir.

Q. All right, Mr. Buck, explain Exhibit 11 to the Court, please, sir.

A. Exhibit 11, taking into account seven wells, as indicated on the red line A-A through the East Texas Field from west to east in direction. The wells as shown by the Schlumberger log penetrated in some instances, such as the Humble Sheppard No. 11, to just above the water table, the Shell Richey No. 6 drilled into the water table, the Atlantic Tooke No. A-87 drilled down through the Woodbine sand section, the Shell Bashum No. 9, the Stanolind Arms No. 11, and Stanolind & Sims-Pearson No. 7, with those Schlumberger logs showing the sand thickness, shale breaks and water level of the East Texas Field, I constructed this cross section.

Q. Where is the water, point that out, please, sir?

A. The original water line of the East Texas Field as shown by the red line was at a minus 3,320 feet. You will notice that there is a rise above that horizontal line of minus 3,320 feet at the present time, and that is indicated by the advance or rise in the salt water as the oil has been taken out of the field.

Q. Well, that water, then, is indicated by that light blue color, I guess, isn't it?

A. Yes, sir, water is indicated by the light  
199 blue color, and the brown speckled area is that area that is saturated with oil.

Q. All right, let's mark that water with a big letter A.

A. A?

Q. Yes, sir, in red. Now, then, where is the saturated Woodbine sand?

A. The saturated Woodbine sand—

Q. What color do you show that by?

A. It is in the brownish yellow color.

Q. Let's indicate that, then, by the big letter B.

A. Yes, sir.

Q. Now, what is that right over there at the east or at the east underneath the yellowish brown color that you have lettered B and which represents the saturated Woodbine section?

A. The dark cross section immediately under the east one-half or third of the field is a base of the Woodbine sand section and is indicated here as the Eagleford shale zone.

Q. All right. Now, let's mark that with a letter C, the Eagleford shale zone, I believe you called that?

A. Yes, sir.

Q. Now, over at the east—west, I mean, and above what you have indicated as the Woodbine sand, I see a dark colored strata indicated there. What is that?

A. That is the Austin chalk that lies immediately above the Woodbine sand.

Q. All right, let's mark that with the letter D.

A. Yes, sir.

Q. Now, then, which well indicated on that 200 cross section is nearest to the Rowan & Nichols twenty-five acre lease?

A. The Rowan & Nichols lease lies between the Allen-Tooke, Atlantic Allen-Tooke A-7, and the Shell Bashum No. 9, in approximately this position (drawing on map).

Q. Mark the line you have drawn there Rowan.

A. Yes, sir.

Q. All right. Now, then, where is that Atlantic Tooke No. 7—A-7 well, on the Plaintiff's Exhibit, No. 10?

A. Here.

Q. Where is the Shell Bashum No. 9 on Exhibit 10?

A. Here.

Q. You marked those two wells with a red circle around them?

A. Yes, sir.

Q. All right. Now, Mr. Buck, the cross section, then, does it or not support your previous statement with respect to the thickness of the sand underneath the Rowan & Nichols lease?

A. Yes, sir.

Q. Now, you have indicated there on your map, or you have mentioned shale breaks?

A. Yes, sir.

Q. I don't believe we have given any letter there to shale breaks.

A. No, we have not.

Q. That will be—let's call that E.

A. Yes, sir.

Q. Now, do those shale breaks run continuously through the Woodbine sand, or is it a matter of just lenses  
201 of shale breaks in the Woodbine sand?

A. There is some of the shale to the west that may run continuously through and pinch out against the top of the Austin chalk, but as a general rule those shales come in and go out in a lenticular manner in a very similar way with which your sand thickness does when you go from east to west.

Q. Do the shale breaks prevent the migration of oil from east to west in that field—from west to east in that field?

A. No, sir, they do not.

Q. Now, yesterday you told me that the average porosity in the East Texas Field was about twenty-four per cent?

A. Yes, sir.

Q. Now, I think you said if you took a core through the sand—does that mean a core taken through the sand here at the east or a core taken through—I mean at the west, or a core taken through the sand at the center, or through the sand here at the east, would show an average porosity of twenty-four per cent from top to bottom of the core?

A. I call your attention to the Schlumberger indication of the porosity, and the crooked line on the left side of each Schlumberger indication is the porosity measurement of the Schlumberger log; right down through the center of each well would be your zero line, and as the porosity line moves away from zero you would expect and get a greater porosity of sand. You will notice as we go through

a shale section the line approaches the zero line through the center of the well. As you come back into the sand the porosity goes out away from the zero line. When you come back into a shale the line goes back toward zero. Immediately upon going through that shale the line goes back out and upon going into shale it goes back toward zero, and you will note from all of the Schlumberger logs a very, very uniform porosity indication on the Schlumberger logs; so through your sand section there unquestionably you would have a uniform average porosity there, and it would only be in such sections as a thin sand section through shales where trashy conditions would prevail, and I think that a porosity of twenty-four per cent, as I have given, is a very conservative figure after studying these better than 400 Schlumberger logs.

Q. All right. Now, what per cent, or what is the per cent of saturation in the Woodbine sand?

A. By saturation you mean oil saturation or water saturation?

Q. Oil saturation I mean.

A. In preparing that formula, Mr. Moody, I took a net sand thickness or an average net oil thickness by studying the Schlumberger, took a porosity factor of twenty-four per cent, a shrinkage factor for the oil from reservoir to surface of sixteen per cent, and a connate water per cent. in the sand of twenty-one per cent, and a recovery factor of seventy-five per cent of the oil in place.)

Q. All right. Well, now, then, in the particular part of the sand, or particular part of the field where the Rowan & Nichols lease is located, what do you estimate to be—what would you say is the net saturation there? You said his sand thickness was about ninety-five. What would you say his saturated sand is?

A. Sixty-five feet.

203 Q. Sixty-five feet of saturated sand?

A. Yes, sir.

Q. What would you estimate to be his porosity?

A. Twenty-four per cent.

Q. Twenty-four per cent porosity and sixty-five feet of saturated sand?

A. Yes, sir.

Q. Now, then, those two factors, saturation and sand thickness, have to do with the amount of oil in place, is that right or wrong?

A. That is correct.

Q. Does the permeability of the sand at that particular place have anything to do with the oil in place?

A. No, sir.

Q. You have been talking about Schlumberger logs here, or electrical logs. The Schlumberger is a name for an electrical log, it is the name of a company that makes electrical logs of wells?

A. Yes, sir.

Q. How extensively are they used, and are they or not regarded as accurate by petroleum engineers and other scientists and oil operators?

A. The Schlumberger log is now universally used everywhere that we explore and drill for oil in the United States and foreign countries in all wildcat wells or out-post wells, and in the early development stages of the field every operator universally uses the Schlumberger or its competitive instrument. In the East Texas

204 Field, of course, the Schlumberger was not brought to this country until 1934, so we had no Schlumberger logs prior to that time. Many of the operators considered that they had sufficient data on the East Texas Field and did not go to the additional cost, but I understand that there has been some six hundred Schlumberger logs that have been run in the East Texas Field, and they are continuing to run them at all times. Now there is one truck kept at Tyler, Texas, and it is kept busy most of the time in the East Texas Field, all the time.

Q. It is regarded as an accurate method?



A. Yes, sir.

Q. Now, Mr. Buck, you said awhile ago your red dash line that runs generally from north to south on plaintiff's Exhibit No. 10 is what you call the zero line?

A. Yes, sir.

Q. And that all wells east of that line—west of that line would produce, under the present plan of proration, would produce less than the amount of recoverable oil originally in place under that, under their respective leases; or let me change the question. I understood you to say that the dash line that you referred to on Exhibit 10 as the zero line, you said that the leases east of that line—west of that line, would, under the present plan of proration, recover less than the amount of recoverable oil originally in place under those leases?

A. Yes, sir.

Q. You said the Rowan & Nichols tract was one of those that would, under the present plan of—

205 The Court:

Counsel, let me make this suggestion: You are setting your stage here so elaborately that it takes too much time. I think you have enough background now to draw your general conclusion and bring this witness to a close, and let the adversary party feel him out on cross examination. The first thing we know we will be like the man who couldn't see the forest for the trees. You will get so much data in here we can't see the forest.

Mr. Moody:

I don't want to obscure the point.

The Court:

There is a great deal of repetition on this, and I think we have the matter pretty well in view. I don't want to curtail you on your record, I realize you have to get all this in your record.

Mr. Moody:

I want to ask him this question; Judge, if he can, from that cross section map, illustrate what he meant by his red line on Exhibit 10 and tell us why that result will be reached under the present plan of proration?

A. Yes, sir, the red line as indicated on the map was the result of several cross sections from the east to west directions through the East Texas Field very similar to the one indicated here. Those cross sections were then plotted on a graphic scale and the volumetric content of the reservoir was computed—I mean the volumetric content of cross section was computed. Then, as the water level rose and flooded out areas, on the assumption that the present plan of proration was in effect and that there was equal spacing of wells along the entire cross section

and a uniform withdrawal from each well, these  
206 calculations were determined and each section north and south through the cross section was divided into 3,000 feet from west to east. Each 3,000 feet meant a new zone. In some of the cross sections there were only seven zones. Some sections went as high as fourteen zones, but as each zone was drowned out by water the other zones were still producing to the east of it, and those calculations were made and from the calculations it was determined that the first zone and the zones following it to the east were not recovering the amount of oil that they had in place. At some point along this cross section east of where the Woodbine border intersected the Georgetown lime wells began to recover more than that amount of oil they have in place, and across this cross section I have found areas where a man only recovered as much as nineteen per cent of the amount of oil that he had in place, and going to the eastward and past this zero line of maximum recovery I have checked wells—leases, and calculated where they recover as high as six hundred per cent more oil than they had originally in place, because of this present method of allocation.

Q. All right, does the present method of allocation allow the oil to move from east to west faster than the fellow can get the oil now present out from under his land?

A. That just depends on how many wells he has and the size of his tract. If he has a tenth of an acre he is getting it out faster.

Q. Through this west half of the field that is the case generally, that the oil is being pushed to the east faster than the wells in the east half can take it out, except where a fellow has a well on one acre or something like that, isn't that true?

A. All of the wells drawing on this entire cross section are responsible for the movement of the water upward and eastward.

Q. Now, have you platted those experiments that you made out on coordinate paper?

A. Yes, sir.

Q. Now, explain to the Court what that paper is.

A. A cross section or graph that I now have, marked Plaintiff's Exhibit No. 12, is a replica of the cross section on the board, but it is drawn to a graphic scale instead of to a different horizontal and vertical scale as indicated on the map, and is coordinated in square inches and divided into twelve and a half zones, and the volume of each zone computed, and then by advancing the water or rising the water in the cross section and growing out to the west I have computed the amount of oil that would be taken out and how much oil each cross section would have produced under the present plan of proration prior to the time that the water completely drowned it out.

Q. All right.

A. Each zone was also calculated for its cubical content, and the difference between what it produced and what it had in place is the basis for determining this zero line of maximum recovery.

Q. All right. Now, can the accuracy of your work there be demonstrated in a laboratory by checking of a device that represents an oil reservoir and using laboratory equipment to demonstrate the accuracy of that?

A. Yes, sir.

208 Mr. Moody:

We offer this in evidence. I might say that I now offer in evidence Plaintiff's Exhibits 7 to 12, inclusive, subject to the right to substitute—return your contour map, Mr. Cottingham, and substitute a copy for it. May we do that, your Honor?

The Court:

Yes.

(The above referred to exhibits were thereupon received in evidence, same being identified as PLAINTIFF'S EXHIBITS Nos. 7, 8, 9, 10, 11 and 12; the same being sent up in the original.)

The Court:

How close to the top is that Woodbine sand? How close to the ground surface does that Woodbine sand get?

A. On the surface?

The Court:

Yes.

A. It outcrops on the surface.

The Court:

Does it carry oil there?

A. No, sir.

Mr. Moody:

We misunderstood. We were under the impression that the Railroad Commission had a sand thickness map that would be available to us, Mr. Hart.

Mr. Hart:

Our agreement was that you could examine any exhibits that we had. We didn't agree to produce any exhibits. I don't recollect that we told you we had a sand thickness map. We said you could use Mr. Hudnall's map.

Mr. Moody:

The Railroad Commission has no sand thickness map?

Mr. Tilley:

Will you state that the Railroad Commission has no sand map of any kind?

209 Mr. Cottingham:

They haven't instructed us to send any map.

Mr. Tilley:

Didn't they have one that was prepared by another engineer?

Mr. Cottingham:

No. Mr. Hudnall said he prepared one while he was in the East Texas Field, but we couldn't find it. I put in a telephone call and our engineer said it wasn't there.

Mr. Tilley:

Somebody told Mr. Herman Jones, in Mr. Moody's office, that you would let us have that map, so somebody must be mistaken.

Mr. Pollard:

The agreement was, you asked us at San Antonio if you could introduce without objection Mr. Hudnall's map, and we agreed.

Mr. Tilley:

Those maps are public and we have a right to them.

Mr. Pollard:

Have you a copy of that transcript?

Mr. Tilley:

It is a public record. We can have it brought down here by subpoena.

The Court:

They say they haven't one. Do you want that checked up again. I am sure they will check it.

Mr. Tilley:

We will have to wait until they get on the witness stand.

\* Q. Mr. Buck, from your acquaintance with the East Texas Field are you able to say whether or not there were few or many instances in which sub-divisions were made of tracts of land subsequent to the bringing in of the field, the discovery of oil in the East Texas Field, and wells later acquired on these areas?

Mr. Hart:

We object to that as being irrelevant and immaterial and a collateral attack on the granting of permits by the Railroad Commission, and which have not been attacked, and if attacked were upheld by the Courts.

The Court:

What is the materiality?

Mr. Moody:

To show some explanation of some of these—

The Court:

I suppose you have to get these things in the record, but the Court and Circuit Court both have had so much to do with this field that you ought not to labor these points too hard. We know a little bit about the field.



Mr. Moody:

I withdraw that. That is within the knowledge of all Courts and they can take judicial knowledge of it.

Q. Now, Mr. Buck, one or two further questions. In the East Texas Field is or not the tendency there for oil to move from points of high pressure to points of low pressure?

A. That is universal in every field, Mr. Moody.

Q. All right. Well, is it—under the present plan of proration, with densely drilled areas in various parts of the field and the wells allowed to produce as it has been indicated by the proration schedule, no allowance being made for acreage and acre-feet of sand under any lease or allocating allowable to wells, is the tendency and the practical application of that order to the field, and in the

operation of the field, is it to cause oil to migrate  
211 and pressures to pass from points less densely drilled to the points more densely drilled?

A. Yes, sir.

Q. Now, you were asked yesterday some questions about the density of drilling in Joinerville and London and Kilgore and various other towns in the field. Is there also dense drilling or drilling that is more dense than the average of the field closer to the lease of Rowan & Nichols than the townsites referred to?

A. Yes, sir.

Q. To the east of the Rowan & Nichols is there more dense drilling than the average of the field and more dense drilling than on the Rowan & Nichols lease?

A. The areas circled in red are all east of the Rowan & Nichols lease, and all have a greater well density than the Rowan & Nichols tract.

Q. All right, another question. In the East Texas Field do you know whether or not there are quite a number of wells over there pumping less than five barrels per day?

A. According to this Railroad Commission schedule there are some pumping and producing one barrel per day.

Q. In other words, the operators are continuing to operate for the one barrel of oil they can get out of them?

A. Yes, sir.

Q. Is that injurious to the wells or property to operate them when you can get only one barrel a day?

A. Injurious to the well?

Q. Or the property or the lease?

212

A. Not that I know of.

Mr. Moody:

Take the witness.

### Cross Examination.

Questions by Mr. Hart:

Q. Mr. Buck, is it your testimony that there will not be any waste caused by reducing the output or allowable of the wells to something like five barrels or less per day?

A. I beg pardon.

Q. Is it your testimony that there will not be any waste caused by reducing the allowable of a well to say five barrels or some figure of that kind, per day?

A. It is not my testimony unless the question is qualified a little further. You could do that and cause waste or you could do that and not cause waste.

Q. Is there a minimum or not below which you cannot safely reduce the allowable of a well without tending to cause waste?

A. The only way that I know that you can hurt a well is to take oil out of it. Now, we start from there and come up.

Q. Well, how would you answer my question? Do you say there is any minimum or not below which you cannot safely go without tending to cause waste?

A. I don't quite follow your questioning, Mr. Hart. I will make this statement. Maybe it will clarify it. That it is entirely possible with a great majority of wells in the East Texas field to produce them at a rate of five barrels per day without creating waste. It is also entirely possible to produce them in such a manner at five barrels per day that they would cause waste. That is a problem—I mean a question that can be answered yes or no. Unless you give me something more definite to base my answer on.

Q. Taking an average well in the East Texas field, what would you say would be a safe minimum that you could go down to without tending to cause waste?

A. Well, Mr. Hart, you can take any well in the East Texas field, good or bad wells, take the best well over there, and if we put it on a daily allowable of five barrels per day, that well, a flowing well now, would not be flowing at the end of two weeks. The well would then have to be put on artificial lift or agitated or something like that, but the oil is still there and the well could be produced, and I see nothing between the fact that where they flowed its oil under a condition of five barrels every day or they took out twenty-five barrels every fifth day or anything like that, that that comes under this question of waste. The only waste that could occur, as I see it, is either to produce at a rate that would be excessive or at a rate to where they abandoned the property and left the oil in the sand. That is the only two things that I can conceive of in the answering of your question.

Q. Let me see if I understand you. You say if you allowed one of those flowing wells five barrels per day that they would within a short time have to use artificial lifting to get the oil out of the well. I believe you said a few weeks?

A. Yes, sir, a matter of about two weeks.

Q. About two weeks?

A. Yes, sir.

214 Q. Now, that is an average well in the East Texas field?

A. Yes, sir, that is correct.

Q. Now, why would you have to begin to use artificial lifting after about two weeks if you had a minimum of five barrels, if you allowed them to produce only five barrels?

A. Here is why you would. The oil in the East Texas reservoir weighs 32.3 pounds per foot in the flow column. If you have a well in there that has two and a half inch tubing 3600 feet long, it would contain approximately twenty-seven barrels. That would be the capacity of that tubing.

Q. All right.

A. Now, if you produce this well at five barrels every day you would be five days emptying your tubing. Now, as you pull up five barrels and stop coming up, like an elevator, and resting that amount of oil in the tubing, gas is liberated from that oil as it passes a pressure point of 725 pounds, and the oil that is accumulated in that tubing gets a weight greater than 32.3 pounds per hundred feet. The reservoir pressure in the field at the present time isn't sufficient to kick out of a well a column of oil that weighs more than 32.3 pounds per hundred feet. If this whole 3600 foot column was present in the well there is no waste there. The gas served the purpose, it brought the oil to the well and lifted it and filled it in the hole. There is no waste there. But you have to get that twenty-seven barrels of stagnant oil out of that tubing before new oil can come in. Now, if you produced the well every tenth day and produced fifty barrels every ten days, you could keep that well alive indefinitely.

215 Q. Well, then, in order to do that, by producing only five barrels per day you don't make the full use of your reservoir energy or pressure there, do you, at a certain length of time, say two weeks, in producing it that way you lose the effect of the reservoir pressure there,

and have to use that artificial lift in order to get the oil out of the well?

A. No, you haven't lost any effective pressure at all. Your pressure is still there, but it isn't sufficient to kick the oil on out of the well.

Q. Because of the conditions that have been created in the tubing, as you have described in detail?

A. Yes, sir.

Q. Now, on the other hand, instead of producing the amount of the allowable production of the well, say at five barrels, say you reduced it to about twenty barrels. Wouldn't that effect that you have spoken of be considerably reduced?

A. In some instances yes. It would be considerably reduced; but you still have that same kind of well.

Q. It would be considerably reduced in every case, wouldn't it?

A. There would still be wells in the East Texas field that would have to be agitated or kicked off with a twenty barrel allowable.

Q. I understand that, but there would be fewer wells if you allowed a twenty barrel allowable than if you allowed say only a five barrel allowable?

A. That is correct.

Q. That is correct, isn't it?

A. Yes, sir.

Q. And so by allowing the wells in the field a twenty barrel allowable, you lengthen the flowing life of those wells, and you postpone the day when they are going to have to be produced by artificial lift?

A. You lengthen the flowing life?

Q. Yes.

A. Yes, sir, that is a correct statement.

Q. And of course by lengthening the flowing life, that postpones the time when you are going to have to put those wells on artificial lift?

A. Yes, sir.

Q. Now, I would like to ask you a few questions about some of these exhibits here, Mr. Buck. First let's take this last exhibit you put up here. I believe you pointed out that this exhibit 11 was not drawn to the same horizontal and vertical scale, your horizontal and vertical scale is different?

A. Yes, sir, it is so indicated on the exhibit.

Q. Now, these wavy lines which are drawn beside these diagrams indicating the well bores here, are they drawn to scale there? How did you arrive at the distance out from those well bores that you would show those wavy lines?

A. I can best show you—

Q. Before you go into that detailed explanation, may I ask you do you mean to say that these wavy lines out here indicate the condition of the sand as far out on the structure as these lines, according to your horizontal scale?

A. No, the horizontal scale is one inch to 500 feet, and one of these small Schlumberger logs was just slipped under the tracing paper and traced off. Of course, 217 this doesn't mean by any means that the Schlumberger represents or penetrated 1000 feet in each direction from that well.

Q. Actually, a Schlumberger test shows the condition outside of the well bore to what distance, if any distance outside the well bore?

A. The first curve on the Schlumberger or the one represented by a solid line has a maximum penetration of the sand of around three to six inches outside of the well bore.

Q. Excuse me. That is the line of the right hand side?

A. Yes, sir. We have three lines here. The solid line has a penetration of around six inches.

Q. All right.



A. The one indicated by the dashed line has a penetration of around two feet, and the one indicated by the peppered line has a penetration of about four to six feet.

Q. Now, these lines on the right are what indicate a resistivity, is that correct?

A. Yes, sir.

Q. Now, the solid line, what does that indicate?

A. They all indicate resistivity. The different reasons for using the first, second and third and some of the later Schlumbergers have a fourth curve on that side so as to give that further penetration in there. Sometimes the first curve runs through the sand and gives an indication of water because it is a drilling fluid that is left in the sand and your interpretation of that resistivity would be water rather than oil, so they have made these additional curves that penetrate further, to get away from the contamination of the hole.

218 Q. Now, these curves on the right, if you have oil say in place there will indicate—the curve will go out from the well bore, will it not?

A. Correct.

Q. Because the oil has high resistivity?

A. That is correct.

Q. What would indicate there a low resistance, is there anything except oil that would indicate a high resistivity?

A. Yes, quite often limestone or sands that have any calcium materials in them show a very high resistivity.

Q. What about shale and volcanic ash?

A. Shale and volcanic ash, as you can see here, offer in some instances high resistivity, depending on the tightness of your section and sometimes low. The interpretation there is a combination of studying both sides of the well log.

Q. Well, where these lines go back and forth they are not regular, they go out and come in, and so forth. They indicate a difference in the resistivity, which would indicate a difference in the amount of oil in place, wouldn't it?

A. No, sir, that could not be said.

Q. What would it indicate?

A. It indicates this instrument is lower down in the hole. Take the Shell Richey No. 36 and make an interpretation of this log from top to bottom. If we left the base of the Austin Chalk we go into a very thin sand section—I mean a shale section. It has no porosity, but it is apparently saturated with something. This log kicks out to the resistivity side. We come through a sand section there, that shows porosity but very little, if any saturation. We go through a shale part in here.

219 That shows very little porosity and practically no saturation. We go into a sand section. Now, as the instrument is lowered down into the hole, you realize that the current coming back to the surface is recorded, the instrument is grounded in your slush pit, one electrode there and the other electrode is going into the hole. Well, it shows electrical currents go back up from the bottom to the top. If they have a section of six feet and the instrument is traveling fast it begins to wave those lines and that can be corrected by raising and lowering your instrument, but the rapid moving of those lines and the time element of taking this survey and getting a Schlumberger away from there means so much that the general operator runs it on through the section.

Q. Do you mean to say those logs are carefully and accurately taken?

A. Yes, sir, very carefully and accurately taken, but I am going into the fact of the detail of trying to compute a log that would show a straight edge line is of no practical importance to a practical man in the field. He accepts the Schlumberger so long as it indicates what is in the hole.

Q. You mean these variations on the right don't mean anything?

A. Certainly they mean something.

Q. When do they mean oil and when not, can you explain that?

A. Yes, sir, the fourth curve, or this dotted curve, it extends out as we have indicated here, unquestionably in an oil section. It whips back right here it comes back out and runs off scale into a good oil section and immediately cuts back and is still in a sand. Un-  
 220 unquestionably that well has water in it at that depth. Now, with this pull back in from the resistivity side, we trace over on the other side of the log and we see no porosity. It is indicative of a shale section, but as we stay in the true sand sections above and below that immediate shale there, the smaller irregularities on your curve mean nothing about how much saturation you might have in that sand.

Q. Well, now, those variations in the curve there are subject to interpretation by engineers, are they not?

A. Yes, sir.

Q. Would all engineers agree on the interpretation of the curve?

A. In general I believe they would.

Q. Now, I believe you have stated that these charts here are not drawn to scale, and in fact the Schlumberger test will indicate the sand condition at not more than a few feet away from the well?

A. That is correct.

Q. How far is it actually between the Shell Richey No. 36 and the Atlantic Tooke No. 37?

A. About 8000 feet.

Q. About 8000 feet?

A. Yes, sir, I believe that is right. Let me check that, please, counsel.

Q. All right. That is from the Shell Richey to the Atlantic Tooke, isn't it?

A. That is right, 8,000 feet.

Q. While these charts that you have put on  
 221 here indicating the sand conditions actually indicate the character only a few feet from the well

bore, you have undertaken on this chart to draw in the shale lenses and so on all of the distance between the Shell Richey No. 36 and the Atlantic Tooke No. 37.

A. That is correct.

Q. You don't have any way of telling that by observation, do you?

A. Not from that cross section there, no, sir.

Q. Are these all of the wells you took into consideration in preparing that chart?

A. That is all of the wells shown on this chart. As I have made this point clear from every red dot that is on the sand thickness map, I have studied the Schlumbergers and have made what I think is a fairly intelligent interpretation of the sand conditions of that field, and I have so indicated that interpretation on my cross section.

Q. Now, the only way of actually finding out how much shale there is and where it is, say, in this area here shown by these three letters B, which is about halfway between the Shelly Richey and the Atlantic Tooke well, would be by putting a well down there and running a Schlumberger on that particular area, would it not?

A. That is correct. I have some additional Schlumbergers that could have been added to this section, but it would have just been a confusion mass of Schlumbergers.

Q. By adding more information you don't confuse things, do you?

A. By addition a section here—a Schlumberger only takes in six feet away from the well, and if you  
222 plant one on top of another, one here and one every six inches, if we are going to take an area of seven miles we wouldn't be able to examine the chart or exhibit it to the Court.

Q. That is just your best judgment about the way those shale lenses extend from the Atlantic Tooke to the Shell Richey?

A. I have made an interpretation between these two wells and shown that as a possible indication of that thing. If you are interested in what that is I have additional Schlumbergers that I can place in there and definitely tie that down.

Q. That is your interpretation of the situation there?

A. Yes, sir.

Q. You don't mean to say that that necessarily shows the amount of shale or its location in that particular area?

A. No, I wouldn't guarantee that that sand section indicated here is four feet thick.

Q. Now, here at the location of the Rowan & Nichols well—

A. Yes, sir.

Q. Which you have marked on this chart, your chart shows no shale or volcanic ash or anything of that kind in that area.

A. That is right.

Q. Have you studied the logs of the Rowan & Nichols wells to see whether the actual logs of those wells coincided with your interpretation of the way that sand ought to be?

A. The fact, counsel, if I had depended on Rowan & Nichol's logs they would have shown this identical thing, because the logs showed the type of the sand and oil sand from there to the bottom, but I did not depend on their interpretation and did study additional Schlumberger logs in the area.

Q. Let me call your attention to the log which was filed with the Railroad Commission on the Rowan & Nichols Well No. 2.

A. A or B lease?

Q. On the B lease, the twenty-five acre lease out of the B. C. Todd Survey. I call your attention to the fact that there the well log shows that the oil sand was struck at 3,573 feet and extended four feet to 3,577 and then ashes were struck at 3,577 and went down four feet to 3,581

and then an oil sand was struck. From that point down to the total depth. Wouldn't that indicate that your interpretation was incorrect, at least in so far as that well No. 2 of that lease was concerned?

A. I didn't put this out as an exact to the foot measurement of the cross section, counsel, but to indicate the general condition in there, and as you have indicated here, we have cap rock from seventy two to seventy three. That would be one foot. And then we have ash from seventy seven to eighty one. That is four feet. This is a forty foot to an inch scale, in there, and we could put, if you want to, those two thin lines in there to indicate the irregularity of this cross section.

Q. Now, Mr. Buck, wouldn't that make considerable difference in what you call the amount of recoverable reserves as to whether or not you had a four foot lense in there of ash or shale?

A. Well, may I say this, counsel, if I said or left the impression that every foot of this sand section from the top here to the bottom was represented by oil, a saturated sand, and that I made those computations for the estimation of the reserves under the Rowan & Nichols lease, I am sorry because I did not attack or work on the  
224 problem in that manner.

Q. In other words, Mr. Buck, this, to be fair about it, is your best interpretation of it from the information you have as to the sand conditions there, but those sand conditions will vary from well to well and lease to lease, won't they?

A. Oh, yes.

Q. And it is not entirely safe to rely on an interpretation of this kind in order to find out the exact character of sand under any particular lease?

A. I would say this, counsel—

Q. Could you answer my question or do you have to go into it?



A. I am just going to make this statement, if I may, please. In making a calculation or information of reserves and using this cross section, it would be utterly stupid, and I have no intention of doing that with this cross section.

Q. Now, Mr. Buck, going on to another point, here, I believe you have indicated that the original water level was approximately horizontal at a subsea depth of 3,320 feet?

A. Yes, sir.

Q. Now, incidentally, bringing out a point which I think was mentioned, the Woodbine sand doesn't outcrop anywhere near the East Texas oil field, does it?

A. No, sir.

Q. It outcrops back up several hundred miles, does it not, near Dallas? Up in that vicinity?

A. That is correct.

Q. And this water which comes down through the Woodbine sand section and finds its way here to where the Woodbine sand is here eventually ends in the East Texas field?

A. Yes, sir. At one time it was all saturated with water, the entire section.

Q. On that I might bring this out, that conge water you spoke of in that oil section is water which remains in the sand after a good part of the water was displaced by the oil?

A. That is correct.

Q. Now, this water level you say was originally approximately horizontal?

A. Yes, sir.

Q. As oil has been withdrawn from the reservoir the water rises above horizontal?

A. Yes, sir.

Q. The water table rises horizontally?

A. Yes, sir.

Q. It doesn't go at one angle or the other but—

A. I have found this, counsel, in the examination of these logs, instead of the water level being in exact horizontal, in an exact horizontal line, it will or there has been a slight tilt, I have found wells producing water at higher depths, right at the Austin Chalk, while in another part of the field it would be at a lower depth, indicating that instead of it being a horizontal line, there is a slight slope to it, it is coming up to this side.

Q. Now, under any system of withdrawal from the East Texas field, a ratable withdrawal from the East Texas field, the water level will continue to rise approximately horizontal, will it not?

A. That is correct.

226 Q. And that means necessarily, does it not, under any system of regimentation that wells on the west will go out before wells on the east?

A. Yes, sir, they certainly will.

Q. That is true, isn't it?

A. Yes, sir.

Q. Assuming that the same conditions are approximately equal throughout the field?

A. Yes, sir.

Q. Isn't that correct?

A. Yes, sir.

Q. Well, now, do you know the subsea depth of the top of the Woodbine sand in the vicinity of the Rowan & Nichols lease?

A. I can give it to you very easily, sir. Minus 3,180.

Q. Minus 3,180?

A. Yes, sir.

Q. And what is the highest point on top of the Woodbine sand in the field or in the cross section that you have drawn here?

A. The cross section I have drawn here is 31—32—around 3,150 or 3,160.

Q. 3,150 to 3,160?

A. Yes, sir.

Q. What is Rowan & Nichols?

A. 3,280. I believe I said that, or 3,180. 3,180, yes.

Q. Well, now; Rowan & Nichols, is higher—than—the top of the Woodbine sand in the Rowan & Nichols area is higher than the top of the Woodbine sand in the extreme eastern edge of the field, is it not?

A. That automatically makes it lower.

227 Q. What would that difference be?

A. Twenty feet.

Q. Rowan & Nichols—

A. Is twenty feet to thirty feet lower subsea depth than this.

Q. All right. Now, the operation of the East Texas field, as you said, on any ratable basis,—basis of ratable taking would mean that the wells towards the east will go out after the wells to the west?

A. That is correct.

Q. In other words, Rowan & Nichols, under any system would be more favorably situated on that basis from all of the wells to the west of them?

A. Unquestionably you are right.

Q. And they would not be so favorably situated as the wells to the east of them if the sand conditions to the east of them allow free passage of oil and water?

A. That is correct.

Q. Now, Mr. Buck, do you find that the sand conditions to the east of Rowan & Nichols, over here in this area are the same as the sand conditions in the neighborhood of the Rowan & Nichols tract?

A. Counsel, from indications of the map here, you can see the number of Schlumberger logs I have examined in the area surrounding and east of the Rowan & Nichols property, and I might say we were very fortunate in having as much information as this to study because there are some areas of the field where I had a sparsity of informa-

228      tion and data, but in the area west—I mean east of the Rowan & Nichols property I had an opportunity to study a big majority of the Schlumbergers of that area there, and it can be definitely tied down, the actual sand conditions of that area.

Q. Now, please answer my question, do you find the sand conditions to be the same east of the Rowan & Nichols tract as they are in the vicinity of the Rowan & Nichols tract?

A. You mean the same in thickness? You know, counsel, they pinch out to the east and the shale fingers are in there, but we have the same general sand conditions to the east.

Q. Compare the sand in the Rowan & Nichols to the sand to the east. You have pointed out one condition, that the sands to the east are much thinner?

A. Yes.

Q. What about the porosity of the sands to the east?

A. The average would be the same porosity.

Q. Are there variations there? Don't you find tighter sands in the eastern section of the field there than you do find in the Fairway around the Rowan & Nichols tract?

A. We have this big gravel section that comes in here, and the porosity of this thin sand thickness is greater.

Q. Does that condition exist all the way over to the eastern edge of the field?

A. Within an area inside of the—from the twenty foot sand thickness on it does, yes, sir, twenty foot sand thickness eastward it does not.

Q. How much is that?

A. That is an area of about 2000 feet.

Q. You mean a distance of about 2000 feet?

229      A. Yes, sir.

Q. All right, from that point on to Rowan & Nichols you say the sand conditions, so far as porosity are concerned are about the same?

A. Porosity, and permeability. The section thins as you go east, but porosity and permeability are about the same.

Q. What about the character of this sand over here, with reference to whether or not there are more or less lenses of shale and ash and other impervious strata of that kind in there.

A. As I explained, counsel, you take your section from ten feet thickness on back to the Rowan & Nichols property there, although there are some shale fingerings entering into there and the sand thins, permeability, porosity, and saturation of that sand and per cent of actual sand saturation to the percent of total Woodbine section is uniform and constant.

Q. Now, in determining the amount of recoverable oil in that part of the field, that is east of the Rowan & Nichols, are you not only taking into consideration in those factors you have already described, but you also take into consideration pressure, do you not?

A. Pressure for recoverable oil?

Q. Yes, sir.

A. Yes, sir, that would be a factor.

Q. Well, that is what I asked. Now, do you find high pressures over on the east side of the field, or do you find very low pressures over on the east side of the field?

A. The areas of low pressure are all more or less confined to the east, north and south ends of the field.

Q. Now, in other words, the area which is east  
230 of the Rowan & Nichols lease, generally has considerably lower pressure than the areas in the vicinity of the Rowan & Nichols lease?

A. No, not considerably lower pressure. In the Glade-water section, the sand—I mean the pressure gradient is very slight compared to the pressure gradient in other portions of the field, but there is a lower pressure to the east than there is at the Rowan & Nichols tract.

Q. Doesn't that mean that to the east of the Rowan & Nichols there is a smaller per cent of the recoverable oil to the east of the Rowan & Nichols tract, than there is on the Rowan & Nichols tract?

A. In place that is true. Under the present method of production it is 100 per cent wrong.

Q. We are now talking about conditions under the present system of operation.

A. All right.

Q. And under the present system of operation the pressures on the eastern side of the field, generally, are much lower than the pressures in the Fairway, are they not?

A. That is correct.

Q. And there are a great many pumping wells at the present time over on the eastern side of the field, are there not?

A. Yes, sir.

Q. Doesn't that mean the wells on the eastern side of the field are going out of production before the wells in the Fairway will go out of production?

A. Not at the present method of operation, it  
231 does not mean that.

Q. You don't think that by reason of the fact wells go on the pump on the eastern side of the field and some are abandoned and pressures are lower over there, that those wells over there will go out before the wells in the Fairway will go out?

A. Counsel, I will explain again that the area of ten foot to twenty foot Woodbine section and westward are all connected together and these wells, even though the pressure in them is such that they have to be pumped today, will be pumping and producing oil considerably longer than Rowan & Nichols will ever produce oil. The wells on to the east of that will be gone and forgotten many years prior to the time the water floods out Rowan & Nichols property.



Q. Well, then, you concede that there is a certain portion of the field which is east of the Rowan & Nichols which would go out of production before Rowan & Nichols?

A. Yes, sir, there is quite a band of production to the east that that will happen to.

Q. Now, how much, how far do you say that extends to the westward from the eastern edge of the thickness?

A. By indicating on this sand thickness map a midpoint, the ten to twenty foot sand thickness, areas east and west of that going out and areas west will continue to produce.

Q. The sections you have taken east and west of about through the Rowan & Nichols lease, that portion of the eastern part of the field, that will go out of production before the Rowan & Nichols lease, and that is about 2000 feet wide?

A. Yes, sir.

Q. And does it or not get wider as you go  
232 down north and south on that point?

A. In some instances it does and in some instances it changes. We are talking about a cross section line through the Rowan & Nichols lease in the Joinerville area. Unquestionably this area will be 3,000 or 3,500 feet wide. In the Kilgore area, it perhaps will be only about 1500 or a thousand or eight hundred feet wide. That depends on the sand as it pinches out against the Austin Chalk.

(At this point a recess was taken until two o'clock, of the same day, at which time the following proceedings were had):

#### Cross Examination (Resumed)

Questions by Mr. Hart:

Q. Mr. Buck, I would like to direct your attention to this chart again, please, sir.

A. Yes, sir.

Q. Your attention to this chart again, please, sir.

A. Yes, sir.

Q. Did I understand you correctly to the effect that as oil is withdrawn from the reservoir under the present plan of allocation the water level will rise almost horizontal or will it tilt somewhat?

A. I made this explanation, that in studying the Schlumberger logs I have found the tendency of the water is to rise a little higher than level at the contact point.

Q. In other words, it would rise more this way than it would this way, is that correct?

A. Yes, sir.

233

Q. And I believe you stated, I want to direct your attention to that portion of your testimony that under the present system of withdrawal or any system of ratable withdrawals the water level would rise so that the wells on the west generally would go out of production before the wells on the east, assuming the sand is practically uniform?

A. That was my testimony, yes.

Q. Then, the wells to the east have an advantage by reason of their structural position, do they not?

A. Decidedly so.

Q. And that advantage existed there in the field before it was ever developed, didn't it?

A. Yes; sir.

Q. Now, would that same advantage by reason of the position on the structure, exist, and assuming that the field was fairly uniformly drilled, would that same advantage exist by reason of position on the structure if there was an unlimited production of oil from both wells, that is an unrestricted or open flow production?

A. In some instances yes, and in some instances no.

Q. Now, I am assuming that the field is fairly uniformly drilled?

A. Yes, sir.

Q. And you say it would not, that the same structural advantage would not exist?

A. That is correct, it would not under wide open flow.

Q. Just explain in what instances the structural advantage would not exist under wide open flow?

A. The area immediately to the east and further removed from the source of energy or water drive and having a thin sand section, under open flow conditions would not flow as long nor recover as much oil because of the rapidly decreasing pressure, and the area in the center or area of thick sand would have a structural advantage under that type of flow.

Q. Apparently the thickest sands are somewhat west of the Rowan & Nichols tract, are they not?

A. That is right, right in that vicinity from the point of contact of the water here to the top of the Woodbine section, that is the area of maximum thickness, slightly to the west of Rowan & Nichols.

Q. In other words, you would move the area of that maximum thickness, maximum recoverability, somewhat east of this point that you have shown by your red line here on this map, Exhibit No. 10?

A. Yes, I did that when I opened the field wide open, that line of zero—zero line of maximum recovery would not be in that place there.

Q. Where would the zone of maximum recovery be on open flow?

A. In the thickest sand section.

Q. What?

A. In the area of thickest sand section, which would be slightly west of the Rowan & Nichols lease and on to the south in one or two places where the sand thickness is eighty feet or thicker.

Q. Would you say the wells on the east of the  
 235 center of the field there would not have any structural advantage under open flow conditions?

A. They would have a slight advantage, but not near in proportion to what they have now.

Q. Now, in determining recoverable reserves, do you take into consideration the position on structure?

A. Yes, sir.

Q. Now, Mr. Buck, on this map here you show that the water level has risen some distance from its original level of about 3,320 feet subsea.

A. Yes, sir.

Q. About where is that water level at this time?

A. As indicated in the Shell Richey No. 36, the water level is approximately minus 3,310 feet.

Q. In other words, the water level has risen in the reservoir about ten feet in about eight years?

A. That is indicated by this Shell Richey well, it has risen at least ten feet in the Shell Richey—in some places not that much and in some other places considerably more.

Q. You don't mean to say, then, that this level of minus 3,310 shows the exact water level? Some places it is higher than that on the structure and some places a good deal lower?

A. That is correct. The only graphic demonstration you could make of that and show the advance of water on the field is like a sketch here, but I did not mean to infer that the water level was flat and straight ten feet above the original water level.

Q. How much variation would you say occurred between different tracts as to the height  
 236 of the water?

A. We have evidence, as indicated on this water map, of wells producing water at minus 3,285 feet and others still producing oil at minus 3,320. That would be about thirty-five foot fluctuation in that level.

Q. Fluctuation in the water level?

A. Yes, sir.

Q. And you can't tell exactly where the water level is in any tract unless you drill into the water sand, can you, unless you have a well already drilled into the water sand and test it by Schlumberger or some other way?

A. Well.

Q. If you have a well already drilled into water you can test that in various ways and find out about the water level, what the water level is at that well?

A. Yes, sir.

Q. Now, will this water level rise at approximately the same rate as you would withdraw more oil from the reservoir, under the present plan of allocation?

A. No, as this water level advances up the Georgetown and the field is confined into a narrower area the water rise would be faster.

Q. Well, how much faster would it be, do you know?

A. It would be just a calculation there, the difference in volumes.

Q. Well, you have approximately the same volume as your water level rises, it would take about the same volume, wouldn't it, because the top of the Woodbine pinches off here as it precedes out this way?

A. Yes, but those volumes are not consistent.  
237 and after the water approached to a point where the Richey well was drowned out the water advance would be very rapid.

Q. Could you tell me what the rate of rise of water would be at the present rate of withdrawal?

A. No, sir.

Q. Now, before the Rowan & Nichols lease would be drowned out there, all of it, there would have to be a rise in the water level from 3,310 minus up to minus 3,180, a rise of 130 feet in water level will there not?

A. The water level, it would take a rise of 150 feet to put the water there.

Q. Would it be 3,180 from 3,310?

A. Yes, sir.

Q. Making 130?

A. Yes, sir, 130 feet of rise. Yes, 130 feet.

Q. All right.

A. But the Rowan & Nichols well would not be, of course, producing until the last foot of that sand is drowned out.

Q. Well, how many feet of sand would it have to have there and still produce?

A. That would be dependent entirely upon what the mechanical conditions were that developed in the well. Some you could continue to produce up to six inches and some would be flooded out at ten feet.

Q. Assume ten feet; in eight years the water level has risen ten feet?

A. Yes, sir.

Q. To rise an additional 120 feet, how long  
238 would it take to rise 120 feet at the same rate of rise and assuming the same production?

A. We can't make those two assumptions, they are not the same.

Q. Aren't you willing to answer my question?

A. No, sir, those two assumptions are not the same, counsel.

Q. Just a minute, sir, and if you can't answer my question say so, but isn't it—assume the same rate of withdrawal?

A. Yes, sir.

Q. Assume the same rate of rise?

A. Yes, sir.

Q. How long would it take for the water level to rise up to a point where there would still be ten feet of oil sand in the Rowan & Nichols well?

A. I can't answer.

Q. You can't even answer that, making those assumptions?



A. No, sir, the two assumptions are crossed, you have to assume either one or the other, but those are contrary.

Q. If there was the same rate of rise and withdrawal it would take about how long?

A. We have had, if it is as you have stated, eight years and ten feet.

Q. All right.

A. So that would be, I believe we figured 130 feet, was it not?

Q. Yes, sir.

A. It would be twenty-five years or something like that.

Q. How much?

A. Two hundred years. I don't know. I can figure it for you.

Q. Go ahead and figure it.

A. I believe your problem is a rise of ten feet every eight years, is that correct?

Q. Yes, sir, that is correct. Ninety-six years, wouldn't it?

A. Yes, sir.

The Court:

Do you think that is helpful to put that in?

Mr. Hart:

Yes, sir, I think it is.

The Court:

I think it is very remote.

Mr. Hart:

I think it is because I think the oil will be produced long before their recoverable oil will be produced long before their wells will be drowned out. As I understand it, their contention has been that their wells will

be drowned out long before they can get their recoverable oil.

The Court:

Of course, I want to let you interrogate this witness as fully as you want to, but this is like all of these oil cases. The expert and the lawyers know so much about it that they can talk about it indefinitely; whereas in the last analysis, when the Court comes to decide it, he has to get it down to a narrow point, and you all scatter it around a great deal. It doesn't give me any help, I know. It may be of some help to the Appellate Court, but I doubt it. What is the use of speculating on what is going to happen a hundred years from now?

Mr. Hart:

It is offered for the purpose, if the Court please, of showing that the estimates they have made of the time they have left to produce, are inaccurate.

240 The Court:

All right, go ahead.

Q. Of course, Mr. Buck, as the water levels rose, the wells here along the western edge of the field would go out of production, wouldn't they?

A. Yes.

Q. And if you kept the same allowable for the field the total withdrawal would decrease?

A. Yes, sir.

Q. And also it would follow, would it not, Mr. Buck, that if instead of keeping the same allowable for the well you kept the same total allowable for the field, as the wells on the west were forced to close down by reason of encroachment of the water, there would be a greater allowable for the remainder of the wells.

A. Yes, sir.

Q. That would follow, of course?

A. Yes, sir.

Q. Now, do you know what the pressure in the neighborhood, the bottom hole pressure, in the neighborhood of the Rowan & Nichols sand was at the time this pro-rata order went into effect in April of 1933?

A. No, sir, I do not know.

Q. Well, in order to refresh your memory, I will ask you if it wasn't about 1200 pounds?

A. Yes, sir, I believe it was in the neighborhood of about 1200 pounds, possibly just a little above 1200 pounds.

Q. At the present time what is the bottom  
241 hole pressure in the vicinity of the Rowan & Nichols lease?

A. I understand it is around 1,228 pounds, but I wouldn't say for sure.

Q. You don't mean 1,228?

A. I mean 1,128 pounds.

Q. That has been a reduction of about how much, then?

A. About seventy pounds, in the neighborhood of sixty-five to seventy pounds.

Q. At the present rate of withdrawal the bottom hole pressure in the field is decreasing at approximately what rate per year, then?

A. I don't know the decrease per year. It is my understanding that the decrease is around from three-tenths to five-tenths of a pound per million barrels of oil produced.

Q. Well, it averages up on production per year in the neighborhood of the Rowan & Nichols lease of something like eight pounds, does it not?

A. That I couldn't say. I will accept your figures on that.

Q. Well, about what pressure would their lease have to be reduced to before they could get out of their wells

twenty barrels a day—before they could not get out of their wells as much as twenty barrels a day?

A. That would depend entirely upon whether there was water in the wells or not. If there was water in the wells, Mr. Hart, the pressure could be 1500 pounds and they would not be able to get twenty barrels out of them.

Q. Assuming no water.

A. With no water they possibly could produce  
242      below 500, or 300 or 200 and still be able to get twenty barrels.

Q. At the present fall in bottom hole pressure by reason of the present proration, that maintains the bottom hole pressure at almost what it was when the method went into effect, it would take a long period of years before the pressure on the Rowan & Nichols tract or in that neighborhood would be so low they couldn't flow the wells, isn't that correct?

A. At the present rate of decline that is true.

Q. It would be a considerably longer period of time than the time that has been estimated in this schedule that was handed to the Court showing the time it would take Rowan & Nichols to withdraw their part?

A. Yes, sir, but the point about that, Mr. Hart, the data that was used to calculate that schedule and the assumption you are making about the water level and pressure are way two different things.

Q. Did you make this schedule here, Mr. Buck?

A. I beg pardon.

Q. Did you make this schedule which was handed to the Court when Mr. Rowan was on the stand?

A. May I see it, please? I made one and checked another. I don't know which one you have there. Yes, I made the calculation for that.

Q. Now, in making the calculations on this schedule of the number of days it would take to recover all of the oil in the field with the present daily allowable, you

assumed all of the wells would continue to produce their present amount until the oil was gone, didn't you?

A. No, sir.

243 Q. Didn't you just divide the number, the amount of the total reserves by the daily allowable and just see how long that would take it?

A. Yes, sir, but that is different from dividing it by the number of wells. I assume there a constant rate of extraction, not a constant number of wells.

Q. As these wells on the west went out the Rowan & Nichols allowable would be increased all the time, wouldn't it?

A. That is right.

Q. In calculating the number of years Rowan & Nichols would take to get their oil you assumed the same daily allowable from there on, didn't you?

A. Yes, sir.

Q. That wouldn't be true, Rowan & Nichols would get a higher allowable as the wells on the west side went on?

A. Some higher allowable, that is true.

Q. So it wouldn't take as long to get their production out as it shows on this schedule to produce their oil?

A. Perhaps not.

Q. That is correct, is it not?

A. That is correct.

Q. Now, Mr. Buck, you have been talking about the pressure here. The only use that pressure has in oil fields is to aid in getting the oil into the well bore and pulling it up to the top of the well, isn't that true?

A. No, sir.

244 Q. Well, what is the use of drilling an oil well unless it is to get oil to the surface of the ground?

A. There is none.

Q. Pressure is useful in doing that in that it forces oil into the well bore and up to the top?

A. That is correct.

Q. Now, if you cut down the minimum allowable of the wells to the point where that pressure will not force the oil up to the surface, you are making—you are thereby depriving the owners of the land on which that occurs of the use of that pressure in getting oil out of the ground, are you not?

A. Counsel, those two things don't follow again. Now, the two assumptions are crossed, are contrary again.

Q. Answer my question, please, Mr. Buck.

A. I cannot answer that, sir.

Q. You cannot answer that?

A. No, sir.

Q. Wouldn't you say that if you produced a condition in the wells where the pressure would not be sufficient to force the oil to the surface that thereby you are depriving the owners of those tracts of the use of the pressure which they could use if they were not restricted in their production?

A. I believe now that I understand a point of your question there. You mean that if production is curtailed to such a point as the column of fluid would accumulate in the well and could not be lifted by the pressure would not the operator then be deprived of his pressure. Is that the question?

Q. I didn't mean—no, I didn't ask you if he  
245 would be deprived of his pressure, I asked you if he would be deprived of any use of his pressure in getting his oil to the surface?

A. He would be deprived of the use of that pressure in getting the oil to the surface.

Q. And I don't think you gave us this morning, and I don't know whether you said whether you could or not, an estimate of the minimum that you could cut wells down to without causing the loss of the use of that pressure?



A. No, it is impossible, counsel, for me to give you that as a blank statement.

Q. Could you give me an average for the east Texas field?

A. An average?

Q. Yes, sir.

A. Yes, I believe I could give you an average.

Q. Of what would that be?

A. Daily extraction, producing the well every day?

Q. Yes.

A. Between fifteen and say seventeen and a half barrels, that would be a striking average on it.

Q. When you take into consideration the Saturday and Sunday shutdowns in the East Texas field, you are actually allowing this well only about fourteen barrels per day, are you not?

A. Yes, sir, that is correct.

Q. And, according to your testimony, then, on the average of the field, if you cut them down to below say fifteen to seventeen barrels a day on an average, you would produce that condition you have spoken of?

246 A. If you were required to produce them every day that is true, that condition would be happening in the field now if you were required to produce every day, but you have two days shut down time in there. What is the difference between two days shut down time and five days shut down time so long as you take enough well out of that oil to keep a live column in your tubing?

Q. You mean it would be better to operate the field once a week rather than five days out of the week?

A. I didn't say that.

Q. You mean the contrary, it would be better to operate it every day in the week?

A. That is correct.

Q. And on an average of from fifteen to seventeen barrels a day?

A. I did not say that.

Q. Please explain that.

A. I would like to make this statement, that I believe that the East Texas field should be produced at a rate not to exceed 400,000 barrels a day.

Q. All right.

A. And I believe further that that allowable could be distributed amongst the wells over there in such a manner that that 400,000 barrels daily production could be taken out of the field without causing waste.

Q. All right. Now, I believe that is on a different point than I was asking you about. Now, talking about this fifteen or seventeen barrels a day.

A. How many wells do we want, 25,910 wells?

247 Now if each of those was allowed fifteen barrels a day, we are above what I consider the maximum efficient rate for the reservoir, but if you want to give each well this fifteen or seventeen or twenty barrels a day and get above the 400,000 I believe more waste would occur on a seven day week program than is now occurring on a five, and would be less if it were produced on a three.

Q. Would it be still less on one, one day per week?

A. Possibly it would.

Q. I don't understand, Mr. Buck, how you can reconcile your statement that keeping the oil in that column there deprives the well owner of the use of that pressure with your statement that you ought to produce the well just one day a week.

A. Well, you apparently don't understand the condition there and you have asked me the question twice with two assumptions that were conflicting. Now, I may be able to explain. In taking oil out of a well at five or three or anything under fifteen barrels a day, over a few days or weeks time, dead oil will accumulate in that well under an average daily pull there, and the well would have to resort to some means of arti-

ficial lifting to get the oil out of there. That is one part of the question. All right, now, the pressure in the field, with the exception of one or two isolated areas is not sufficient to lift that column of oil out of the tubing. Now, if we have a field allowable, a top field allowable that has to be distributed amongst the wells that you have given me of 25,910 we have already cut this thing to fourteen barrels per day by having two days shut down.

Q. That is right.

A. All right. Now, if we are to continue on 248 and reduce it below this fourteen barrels, it necessarily follows you would have to have four shut down days.

Q. All right, sir, I think I understand it now. You say that you believe about a four hundred thousand dollar—four hundred thousand barrel top allowable is the proper total allowable in the East Texas field?

A. I believe that would be a maximum, yes.

Q. By maintaining the pressure you cause a larger recovery from the whole field, do you not?

A. That is correct.

Q. And assuming that a man's lease is drilled to the average density of the field or better a man under this system of allocation will get more accurate recovery out of his lease under this system than he would under open flow conditions?

A. Oh, no, you could have through a cross section of the field 500 examples to the contrary of the statement you have made and then other examples that would conform right with it under wide open flow.

Q. Do you mean that because of the density of drilling around the—

A. No, I am not meaning the density of drilling at all, I am assuming equal spacing and making that statement. If you are going to then go to uneven spacing it is even more out of proportion.

Q. Well, then, on some tracts you would get more recovery and on others you would get as much ultimate recovery as you would get under open flow conditions?

A. I can state this, if it be in answer to your  
249 question, that on the extreme west side of the field, under open flow for the whole field, the western one-fourth of that field would not recover as much as it would under regulated withdrawals. There are other portions of that field that would recover more under wide open flow than they would under regulation, and there are others to the east side of that field that would recover considerably less under wide open flow than they would under regulated control. You have a field here that is from four to thirteen miles wide and it depends upon the structural position there whether we are going to assume whether we have wide open conditions or regulated control conditions.

Q. Under the present system of proration you would get a larger total recovery from the field?

A. Yes, sir.

Q. Now, as to the Rowan & Nichols tract under the present system of proration, will he or not get a greater total of recovery from the tract than he would under open flow conditions?

A. He would not.

Q. How much less would he get?

Mr. Moody:

Wait a minute. I don't understand that "he would not" answer to the question.

A. He would not recover as much under regulated withdrawals as he would under wide open withdrawals.

Q. Would he recover more of the oil while the wells were flowing under the present situation than he would under open flow conditions?

250 A. I believe that his flow period there or recovery of flow would give him more barrels under wide open conditions than it will under the present plan of regulated control.

Q. Now, Mr. Buck, what do you mean by the recoverable reserves under a tract?

A. That is how much oil he will get between now and the time that the property will be abandoned.

Q. Do you restrict that to the oil that he will recover that is directly under his tract?

A. No, sir, that is the amount of oil that he will reduce to possession in his tank, wherever it might come from.

Q. Well, now, do you mean in figuring on the recoverable oil from the Rowan & Nichols tract, you figure oil that will migrate to his tract from the tracts to the west?

A. That is correct, that all had to be taken into consideration, counsel.

Q. Well, what about the boys on the west there in figuring their recoverable oil, would you figure their recoverable oil—would you figure the oil they had in place less what they are going to lose by migration to the east?

A. No, you are talking about recoverable oil and migration, they are not the same.

Q. I asked you in figuring the recoverable oil under the tract on the western edge of the field, would you take the oil which they had in place and take from that the oil they would lose by migration to other wells to the east of them?

A. You don't need to make that subtraction, the subtraction is what they had in place to what they recover. The balance or other part is what moves upstructure.

251 We are dealing with the recoverable oil and oil he produces in his tank off of the ground, whether he has one barrel per acre or one hundred thousand barrels per acre in place.

Q. In considering the recoverable reserves in the Rowan & Nichols tract you not only consider the oil under his place and the physical characteristics, but you also figure the oil he will gain by reason of oil being forced to his tract from tracts on the west, is that correct?

A. It is not a question of gain, it is a question of loss from his structural position.

Q. Would you just answer me, please? Do you consider the amount of oil that is driven to his tract from the west in determining his recoverable reserves?

A. I can't consider it because I don't know how much there is there. I can give it to you in time or in barrels or in recovery, but not in the amount of oil that is passing under his tract, I can't give you that answer.

Q. Well, as I understood you, Mr. Buck, you stated that you don't consider just the oil in place under the tract and then determine what percentage of that is recoverable, but you take into consideration the oil that he will acquire from some other place in determining what his recoverable reserves are.

A. I think my testimony on that is quite different from the way that you have stated it, counsel.

Q. Well, then, please tell me what you do consider in determining what the recoverable reserves under a tract are.

A. The recoverable reserves under a tract in the East Texas field depends upon first the amount of oil that he might have in place, the structural position of that oil.

Q. Now, just a minute, please. Now, what  
252 do you mean by structural position? You mean if he is on the east he would probably get some more oil in addition to the oil in place under his tract?

A. It could be that.

Q. All right, you think that that ought to be taken into consideration in determining the recoverable reserves of a tract?



A. It unquestionably has to under this plan of operation in the East Texas field.

Q. Well, then, these people over here to the east of Rowan & Nichols that may have a little less sand thickness but are to the east of him, because of their structural position, you would say they had a larger recoverable reserve than he?

A. Yes, sir, that is the very point.

Q. Then there is nothing inequitable in them producing longer than Rowan & Nichols?

A. Sir?

Q. Because of the natural advantage they have by reason of the location in the field, there is nothing inequitable in their producing longer than Rowan & Nichols produces?

A. I don't see—I don't quite understand the question. I beg your pardon. If you would state it once more, please.

Q. I think the question is pretty plain.

A. Will you get the Reporter to read it back to me, please?

(Question read.)

Mr. Moody:

That calls for a question of law. I think that question calls on the witness to express an opinion of law.

253 The Court:

I think it is an argument.

Mr. Moody:

And, an argument.

Q. All right, sir. Now, you say you take the oil in place, that is the cubical content of the area within the oil saturated sand under his tract, you take that into

consideration in determining his reserves. Now is that correct?

A. The oil in place or—yes.

Q. Then, you take into consideration the structural advantage?

A. The structural position.

Q. The structural position?

A. Yes, sir.

Q. And if a person is farther east from Rowan & Nichols he would have more advantage by reason of his structural position than he would if he was located west of Rowan & Nichols?

A. At the present time by this proration he does have.

Q. Did you take that into consideration when you made your estimate of the amount of recoverable reserves that Rowan & Nichols had?

A. Yes, sir.

Q. You took that into consideration?

A. Yes, sir, I did.

Q. Now, Rowan & Nichols had a certain amount of oil you figured in place there, I believe, and they have drawn out 355,254 barrels. How many barrels of oil do they now have in place under their tract?

A. The first figure was one million five—

Q. 1,056,422 and we have withdrawn 355,254. Now, my question is—

A. They have—

Q. Let me ask the question. My question is  
254 how many barrels of recoverable oil do they now have in place under their tract?

A. Well, I thought the first question was how much did they have now in place, and now you are asking me, recoverable oil. Their recoverable oil figure is what is on that schedule. The oil in place is approximately the same as what it was to start with.

Q. The oil in place now is approximately the amount that they had when they started out?

A. Yes.

Q. When they first drilled their well?

A. That is correct.

Q. Then, if you consider only the oil in place under their tract they would now have under their tract approximately the same amount of recoverable oil that they had at the time they drilled their first well?

A. No, sir.

Q. All right, sir, to what extent has the amount of recoverable oil under their tract been reduced to this time?

A. The amount of recoverable oil under their tract has been reduced by whatever proportion that they have taken out of there and the field has been depleted. The field has been depleted a certain per cent and Rowan & Nichols' properties have been depleted a certain extent, although they have probably the same amount of oil they had in place in the beginning, they are not going to have an opportunity to recover that oil under any sort of a regulated proration plan in the East Texas field.

Q. Well, they have gotten about twenty-five  
255 per cent of the oil in about eight years, haven't they?

A. Yes, sir.

Q. And when we figured at the rate at which the water level was rising or bottom hole pressure decreasing one was forty years and one was about a hundred years that it would run out?

A. You figured that.

Q. Were my figures incorrect?

A. Not with the assumptions you made. Your assumptions were incorrect, sir.

Q. Now, at the present pressures which exist under their lease can they still flow their wells?

A. Yes, sir, they are flowing today.

Q. And how long will it be before those wells will be,—will those wells continue to flow under the present rate of withdrawal, how long will they continue to flow?

A. That I couldn't tell you. Maybe in excess of ten years. I don't know.

Q. You don't know how long it will be?

A. No, sir.

Q. Now, Mr. Buck, you testified that there are certain factors that you take into consideration in determining the amount of recoverable reserves under a tract and, you mentioned first of all the cubical content. Now, is the cubical content, the cubical content of any lease something that can be computed with accuracy, the cubical content of the oil sands under a lease?

A. Now, by accuracy do you mean to a  
256 mathematical accuracy of one foot or to an accuracy to which we work and do business on?

Q. About what variation would you have on that or what amount of error would you have in figuring the cubical content of oil sands under a lease?

A. I think with the information we have available now, that whatever error that might enter into the calculations, whether it be five per cent or twenty-five per cent would be a uniform error over the entire calculation for every tract in the field. That is the only way that I could answer that question, counsel.

Q. Well, you might have an error of from five to twenty-five per cent in determining the cubical content of your lease, is that correct?

A. Of anyone's lease, but whatever calculation or base of calculation that you made that error on would be the same, the error would be consistent whether it be high or low, for the rest of the tracts.

Q. Well, now, let's examine that a minute. You might make a mistake in favor of one man, of twenty-five per cent and against another of twenty-five per cent?

A. No, it is not a cumulative error.

Q. Sand varies in thickness according to the top of the sand and the bottom of the sand and the amount of shale in it and all those things, does it not?

A. That is correct.

Q. And if you strike an average you might do one man a twenty-five per cent injustice and another man you might favor him as much as twenty-five per cent, might you not?

A. I don't see how that could come into the  
257 calculation at all.

Q. You mean to say that you wouldn't have any error between tracts at all in calculating the amount of cubical content there?

A. It is possible there would be some error. The point I am trying to make is whatever error you made in cubical content of one tract would be a compensating error and that if you took the average figures which I have given you then whatever error existed in one calculation would be a consistent error throughout the west or east of them, whether for or against.

Q. If you go to averages you do one man an injustice and you are giving another man more than he is entitled to?

A. Possibly so, yes, sir.

Q. According to what you have said you ought to try to give a man a recovery according to the reserves under his lease?

A. Yes, sir.

Q. In considering this one factor alone tracts vary considerably by tract to tract and there might be as much as a twenty-five per cent error in this cubical content?

A. No, sir, that would be impossible from tract to tract, from one end of the field to the other you could have a variance of twenty-five per cent, but not from tract to tract.

Q. Now, after you have determined that cubical content there his porosity is one of the things that you will take into consideration in making that man this mathematical calculation?

A. Yes, sir.

Q. You spoke yesterday—yesterday you gave an example of basket balls and BB shot, I believe?

A. Yes, sir.

Q. Now, the amount of porosity between  
258 those spheres, either basket balls or BB shot, would depend on how they are packed, wouldn't it? The porosity wouldn't be always the same?

A. I believe—

Q. Just a minute. You made the statement one room would be full of BB shot and one of basket balls. Wouldn't that porosity depend on how the balls were packed? Whether they were packed cubically, that is, the diameter of one ball directly on the diameter of another or packed fifty per cent off their diameters?

A. Yes, sir, if you arrange them the same, they would have the same porosity.

Q. Assuming the same number of balls or spheres in the room, you would get a variation in porosity from forty-three per cent down to twenty-eight per cent, wouldn't you?

A. No, sir.

Q. Have you made those calculations?

A. I know it is impossible, counsel, for it to vary it from forty-three per cent to twenty-five per cent under the situation you have given me.

Q. Well, assuming that—do you or not say that the method in which they were packed would have any difference, make any difference in the amount of porosity?

A. Unquestionably so.

Q. And what would the variation be in the amount of porosity that would enter into your calculation?

A. On these two spherical conditions you have given me there I couldn't answer.



259 Mr. Moody:

May it please the Court, that illustration that was just used to show what was meant by porosity and permeability, and I think it is immaterial whether it is more or less porosity, depending on whether you stacked one on top of the other or stacked them like corn in a bin.

Mr. Pollard:

Our purpose is that by different arrangement of packing of balls, just as it is true in sand grains of different horizons, there would be a difference in porosity.

The Court:

I think you are going into too much minuteness.

Q. Now, what is the variation in the porosity in the East Texas sand?

A. The porosity determinations that I have seen vary from around fifteen per cent to as high as thirty-three per cent.

Q. Fifteen per cent to thirty-three per cent?

A. Yes, sir.

Q. All right, sir, have you ever known of greater variations than that or is that just a sort of average variation?

A. No, sir, that is the maximum and minimum variations of porosity that I have seen in the East Texas field.

Q. You know to what per cent—what per cent of saturation from connate water do you find in the East Texas sand? Do you find any variation in that?

A. I have not found any. I don't have the connate water percentage taken from every core over there. I have found that some connate water percentages, which were taken right at the oil-water contact and immediately below it ran of course as high as ninety to ninety-

five per cent water and five to ten per cent oil,  
 260 but when you get into the oil structure, you  
 have a fairly consistent connate water percentage of around twenty-one per cent.

Q. Well, sir, now what shrinkage factor do you allow?

A. I allow sixteen per cent.

Q. Do you allow that same shrinkage factor, would that apply all over the field or not?

A. I have so applied it.

Q. Do you think that would be accurate?

A. I think this, that whatever the shrinkage factor is, whether sixteen per cent or twenty per cent, that shrinkage factor is consistent for that type of crude oil.

Q. But the oil is under varying pressures in the reservoir, isn't it?

A. That is right.

Q. So that your estimate would not be exactly accurate?

A. It would, sir, if you get the shrinkage in the reservoir before you get it to the surface your shrinkage will drop from 725 cubic feet to the barrel in solution to a barrel of dead oil without any gas in it on the surface, that is the same.

Q. Those factors I have named, cubical content, the porosity, the pore space, the shrinkage factor—what percentage of permeability, what is the variation of permeability in the East Texas sand?

A. That varies from somewhere in the neighborhood of around 425 to as high as 3,000 millidarcys.

Q. Now, have you named over all of the  
 261 factors that you are taking into consideration in calculating the recoverable reserve?

A. No, I have placed one other correcting factor in my formula.

Q. What is that?

A. That is a recovery factor of seventy-five per cent of the cubical content.

Q. Don't estimates of competent engineers vary that recovery factor from say forty per cent up to what you are giving it, say seventy-five per cent?

A. I think—in fact, I have seen recovery factors that varied all the way from forty-five per cent to one hundred per cent.

Q. Would the recovery factors vary from lease to lease or would you give a constant recovery factor for all over the field?

A. I gave a constant recovery factor for the East Texas field and made calculations for the estimated recoverable oil for the field and I used the same recovery factor for the Rowan & Nichols lease. Now, you are correct, counsel, that in some leases the recovery factor would be greater and in other leases the recovery factor would be less.

Q. In other words, in order to fairly ascertain the recoverable reserves you would have to vary that recoverable factor from lease to lease?

A. That is correct. Not from lease to lease, but from segment of the field to segment of the field.

Q. In other words, all of those elements you have taken into consideration in calculating the recoverable reserves under a tract are variables and subject to errors within the limits that you have indicated?

A. They are variables, particularly variable  
262 under a per well method of allocation. They are variables and subject to error in any type, but surely under the present method of allocation over there, they are subject to more error than they would be under a better or different type.

Q. Please answer my question. I don't want to take too long in examining you.

A. Excuse me, sir.

Q. Now, all of those factors are taken into consideration in determining the amount of recoverable oil under a tract, and by that you mean the amount of oil that will be brought to the surface of the ground, is that correct?

A. Yes, sir.

Q. Do you also have to consider in that, rate of withdrawal?

A. Oh, yes.

Q. You are assuming a constant rate of withdrawal? Is that correct?

A. That is correct.

Q. Now, are any of those factors which you say could properly be taken into consideration in determining the recoverable reserves under a tract of land reflected by the potentials or by the potential test?

A. I cannot think of any of those factors that would be reflected by that potential test.

Q. Let's look, Mr. Buck, at these two exhibits up here. The one up here in the upper left hand corner and the one in the lower right hand corner. I believe that is the sand thickness map?

A. Yes, sir.

263 Q. Would you say that there is any relation of any kind between the potential contours and the contours showing the sand thickness in the East Texas field?

A. Yes, sir, there is a very definite relationship there.

Q. Very definite and marked relationship, is there not, between the potential contours and the sand thickness contours?

A. Yes, sir.

Q. In other words, where you have a thick sand, you also have a high potential, don't you?

A. No, where you have a thick sand you have a key well that you took a potential on.

Q. All right, let's sit down. When you were there working for the railroad commission, when their first potential tests were made—

A. I was not working for the Railroad Commission at that time, but the commission had borrowed me back from the people I was working for and I was up there at the time and helped select the wells and talked to the operators for getting the selection of them, but I was not on the payroll of the State of Texas.

Q. Was that when the tests were made, while the whole field was shut down?

A. Yes, sir.

Q. And what time were those tests made?

A. Going from memory it must have been from maybe the tenth or twelfth of April or it might have been as late as the seventeenth of April of 1933 to the end of April. I just remember it was in there. It seems like it was a ten day or twelve day shut down. I don't remember just now how long the field was shut  
264 in or how long it took us to complete the tests.

I know I was in the field better than fifteen days on the assignment.

Q. Is that the only potential you helped take?

A. Yes, sir.

Q. There have been other potential tests taken since then, haven't there, Mr. Buck?

A. There have been other wells tested, and I believe another potential test was made, maybe for testing all of the wells, but I don't believe the field was ever shut down entirely again to take a potential test.

Q. In 1935 the key wells were selected and another potential test made on which that potential map is based, was it not?

A. I so understand.

Q. Now, in selecting the wells the commission picked out wells which are scattered throughout all sections of the field, did it not?

A. No, sir.

Q. Aren't these wells scattered pretty much from the eastern to the western side and from the northern to the southern, all over the field?

A. They are scattered through an area of sand thickness of thirty feet or better in practically every instance in the East Texas field.

Q. Well, you got dry holes on the edges to determine the outer limits of the field?

A. Oh, yes.

Q. And you say they began about thirty feet or better and went in?

A. I say some of them are as low as that.  
265 The majority of those wells are well within the thirty foot thickness and are thicker than that.

Q. But, say within those limits the wells are scattered throughout the field, they were scattered throughout the field, were they not?

A. On a line north to south right down the center of the field, and varying two or three thousand feet in each direction, that is correct.

Q. How far is it from this well over here, this key well, to this well over here, do you know?

A. Approximately ten miles.

Q. Ten miles?

A. Yes, sir.

Q. That is directly across the field, isn't it, east and west?

A. Yes, sir.

Q. Well, they went a little farther than about a thousand feet on each side of the center, didn't they?

A. It is ten miles between wells across the center of the field, counsel. I was speaking from the well to the outside limits of the field.

Q. Oh, from the well to the outside?

A. No, wait a minute. I understand your point. My answer, I believe, to your question was that it was



within the thirty feet sand thickness or closer to the center of the field and you pointed out one instance where the wells are around ten miles apart.

Q. Mr. Buck, I am trying to get out of you, 266 if I can, whether or not the Commission selected throughout the field wells in various sections of it in order to make a fair test of the potentials of the wells throughout the field. Now, did the Commission scatter the wells throughout the field or not?

A. They are scattered along a strike line of the field, but not throughout the field, at all.

Q. Do you know whether those wells that were tested, whether the Commission required uniform equipment on those wells, those key wells that were tested at the time this map was made, or before this map was made and on which this map was based?

A. It is my understanding that they did.

Q. Well, then, you can disregard then, can you not, the mechanical equipment of the wells for the reason that the test wells were wells that were all equipped the same way.

A. So far as casing and flow lines is concerned, that is correct.

Q. Well, then, assuming that that is true that the wells were scattered over the field here, and that they were equipped in the same way as far as mechanical equipment was concerned, you get by these tests and by running contours between these key wells contours which reflect roughly the sand thickness in the field, do you not?

A. Oh, yes, very rough.

Q. Well, it is pretty close, isn't it?

A. I think not. I can show you areas in there where it conforms almost exactly and then other areas where it doesn't conform at all.

Q. That is true, but you get the general picture of the higher potentials down the middle where the rate of sand thickness is, don't you?

A. Yes, sir, you certainly do.

Q. And you get the picture also of the lower potentials on each side away from the center in the same way you get the smaller sand thicknesses as you go away from the center?

A. That is correct.

Q. Well, to that extent, you would admit, would you not, Mr. Buck, that the potential test indicates or reflects to some extent the sand thickness?

A. In the way that you have stated it, and the way that you have explained the completion of those wells, I would say yes.

Q. Well, now, does the potential test or the potential contour line reflect to some extent the factor of permeability which you take into consideration, which should be taken into consideration in calculating the recoverable reserves?

A. I had no permeability factor in that and I think your potentials, Mr. Hart, are more of a reflection of permeability than porosity or sand thickness.

Q. The answer, then, is yes, is that correct that the potential tests do reflect permeability?

A. No, I say that in the way you have stated the question it is possible to reflect permeability.

Q. Well, if you have two wells with the same equipment and all of the factors were the same except the permeability and one had a higher permeability than the other, would the one that had the higher permeability show up better on the potential test than would the one that had the lower permeability?

A. Yes, sir.

Q. So the potential test does reflect to some extent the permeability of the sand?

A. All other factors being the same, yes.

Q. All other factors being the same?

A. Yes, sir.

Q. Now, does the potential test reflect to any extent the porosity of the sand?

A. Only in so far as it reflects the permeability.

Q. Well, now, assuming that you have—in other words you say that you first determined the porosity and then you—although you might have the same porosity, you might have more or less permeable sand?

A. That is correct.

Q. And would it or not be possible for the porosity—for the permeability to be the same and the porosity to vary?

A. That is correct.

Q. All right, then, suppose you have two wells where one had a higher porosity than another and all other factors were the same, would the potential tests reflect the difference in porosity between the wells?

A. No, sir.

Q. Would the well that had the higher porosity have a higher potential than the well that had a lower porosity?

A. Permeability being the same the potential test would be the same.

Q. Regardless of the porosity?

A. Yes, sir.

269 Q. Well, now, what other factors then besides acreage would you take into consideration in determining the recoverable reserves that would not be shown in any way by the potential test?

A. Besides acreage you say?

Q. Yes, not reflected in any manner by the potential test.

A. Mr. Hart, I don't know just how to answer a question like that.

Q. Well, aside from the acreage, let me put it this way: Aside from the acreage of a tract, doesn't the po-

tential of a well on a tract, assuming uniform equipment according to the test that was made here, reflect the combination of all the factors that enter into the amount of recoverable oil as they actually work out on that tract?

A. The amount of recoverable oil?

Q. Yes, sir.

A. The potential and the amount of recoverable oil have no connection or bearing at all, sir.

Q. Although potential does reflect permeability?

A. Very decidedly so if taken under the conditions you have given me.

Q. And sand thickness?

A. Sand thickness in some measure.

Q. It reflects pressure, doesn't it?

A. Yes, sir.

Q. Although it reflects those factors you say it has no indication whatever of the recoverable oil?

A. Absolutely none.

Q. I believe you say, Mr. Buck, that you were out there in the field appraising some wells. Did you make tests on the potentials on the amount they would flow in trying to determine whether or not or what the recoverable reserves were under the tract?

A. No, sir, I gave them a pumping test to  
270 see what they would produce.

Q. Wasn't the reason of giving them a pumping test to find out how much oil would come up to the surface? That is, what you were trying to find out, wasn't it?

A. Yes, sir.

Q. And by that method of testing what could be produced on a tract you would arrive at a whole lot more accurate estimate of what the factors would be than by sitting down and figuring it out mathematically, wouldn't it?

A. The two statements again don't follow.

Q. You say that is not right?

A. That is not right.

Q. You don't think that by testing the amount of oil that would flow to the top you get a more accurate estimate of the recoverable reserves on a tract than by sitting down and trying to figure out by some mathematical formula what it would be?

A. I didn't testify to that.

Q. Isn't a potential test a method of figuring out how much is going to come to the top?

A. That is nothing more than a mechanical flowing of a well to determine how much will come out at a time. I went over to pump these wells to see whether or not they would produce or not and what it was going to cost me to produce the wells. I had a definite problem, what it would cost me to get the oil out of the ground and how much it would cost to produce.

271 Q. It was an economic problem, nothing to do with the potential of the well.

Q. If you found out those wells wouldn't produce more than ten barrels per day you wouldn't keep on producing them, would you?

A. They are still producing. I didn't purchase the property or recommend its purchase.

Q. Couldn't you just figure out mathematically what those wells would produce?

A. No, sir, because in there, that was a part of the field I didn't know what they would produce.

Q. Is that the only part of the field where you don't know that?

A. No, sir, there are other parts of the field where you don't know that.

Q. So the best way to find out what they will produce is by taking some test to see how much oil is brought to the surface, is that right?

A. In the same type of problem of any well in the Fairway or in the center of the East Texas field which is still flowing I would be more concerned with what

the pressure on that lease was than the cubical content of the—and the aerial extent of the property than I would of taking a potential test out there, whether I flow the well for half an hour or fifty days.

Q. I just want to ask you one more question, Mr. Buck.

A. Yes, sir.

Q. Looking at this diagram here, if you took one of these tracts on the west edge of the field, figuring out the recoverable reserves in place, would you take into consideration the oil that was there in place, or would you take that into consideration only, or would  
272 you also take into consideration the fact that part of that oil as the well was produced would be driven towards the east?

A. You would necessarily have to consider, counsel, what oil is migrating up east by the withdrawal of it.

Q. Then, all of these fellows between the western side of the field and Rowan & Nichols are going to be losing oil toward the men to the east of them, aren't they?

A. Yes, sir.

Q. Rowan & Nichols may be hurt some, but not anywhere near as much as these parties here?

A. No, not near as much as the ones west of Rowan & Nichols.

Q. Some are hurt and some are benefited?

A. That is correct.

Q. Rowan & Nichols are just about in the center of the lot, just a little bit over on one side?

A. Yes, sir.

Q. And under any theory of ratable production, the same thing would be true, would it not, more or less that the wells on the west would lose oil to wells on the east?

A. But not nearly in the same proportion.



Q. But not nearly in the same proportion?

A. No, sir.

Q. But the same thing would take place to some extent?

A. To some extent, yes, sir.

Q. Mr. Buck, at one time didn't the Railroad Commission have in effect, I believe you have already testified they had in effect, a plan of proration which allocated a certain amount of oil per well and the rest on a basis of pressure and sand thickness.

A. Pressure and sand thickness or acre feet  
273 of sand, I disremember now. It may have been sand thickness, but I think it was acre feet of sand.

Q. I think it is on the basis of sand thickness. Were you working with the Commission at that time?

A. Yes, sir, I wrote the order, whatever it was.

Q. You wrote the order?

A. Yes, sir.

Q. Now, when that system was in effect there was a variation between the marginal, the lowest wells and highest wells, of only seven barrels, wasn't there?

A. I believe that is correct.

Q. And where the lowest got about thirty and eight-tenths and the highest got about thirty-seven and eight-tenths?

A. Something like that.

Q. In other words there wasn't a greater percentage of variation between nearly all of the wells and the highest wells as there is in the present order?

A. No, the spread between the wells was just about the same.

Q. You admit, don't you, that there would have to be some minimum allowable for the field?

A. A minimum?

Q. In order to prevent waste.

A. Yes, sir.

Q. Then, there would only be a certain amount above that that you could prorate among the other wells on any basis?

A. Yes, sir.

274 The Court:

I don't understand that.

Mr. Hart:

I didn't make that clear.

Q. Under any system, then, if you allow a minimum allowable, if you fixed a minimum allowable that you would give to all wells that could produce that much then there—

The Court:

You are talking about the individual wells, not the entire field?

Mr. Hart:

Yes, sir.

The Court:

Go ahead.

Q. A minimum allowable per well?

A. Yes, sir.

Q. And you had a fixed top?

A. Yes, sir.

Q. Then there would be only the difference between that minimum times the number of wells that would produce that and the top to be prorated to do that with?

A. The way you have stated that, that is correct.

Q. And when you take into consideration the order you wrote up of sand thickness and acreage I believe, or sand thickness and pressure,—

A. Sand thickness and pressure.

Q. Sand thickness and pressure, why, there was only a variation between the minimum, which was fixed at thirty barrels and the top of 37.8 barrels, about seven barrels, is that right?

A. That is the way that order was, yes, sir.

Q. That order that you wrote was in effect only about eleven days, wasn't it?

A. Ten or eleven, something like that.

Q. Now, the Railroad Commission has tried  
275 a number of different ways in order to try to make a fair allocation of this oil in the East Texas field?

A. Allocation between leases?

Q. What?

A. You mean allocation between leases?

Q. Allocation between wells?

A. Allocation between wells, it has been practically a per well basis of allocation since the beginning of that field.

Q. Well, it was actually on a per well basis up until 1932, wasn't it?

A. Yes, sir.

Q. Then for a while, for about two weeks there, possibly less than that, there was a two-thirds allowable on the basis of per well and one-third on pressure and acreage?

A. Yes, but in effect that was still better than ninety per cent per well.

Q. And then they tried this sand thickness and pressure order that you drew, I believe?

A. Yes, sir, that was still per well.

Q. In 1933 and since that time—they have since about April, of 1933, the Commission has been prorating the allowable in the East Texas field on a basis of the percentage of the hourly potentials, is that correct?

A. A very small per cent of that. It is still virtually per well.

Q. You haven't answered my question.

Mr. Moody:

Read the question.

(Last above question read.)

276 Q. The Commission started out in 1933 allowing fifteen per cent of the hourly potential and it has gotten down to about 2.32 of the hourly potential, is that correct?

A. Yes, sir.

Q. During that time about fifteen or sixteen thousand wells have been drilled in the East Texas field, have they not?

A. Yes, sir.

Mr. Hart:

Pass the witness.

### Re-Direct Examination.

Questions by Mr. Moody:

Q. This order here of March 9, 1933, following the hearing on February 23 and 24, 1933—March, 1933, is the date of the order that takes into account pressure and sand thickness. You say you wrote this order?

A. Yes, sir.

Q. Was that your formula or were you told to prepare the order on that formula?

A. No, I was given the figures to prepare that on.

Q. Well was this practically a per well basis?

A. Yes, sir.

Q. A variation of some 7 or 8 or 9 barrels between the wells with high pressure—low pressure and thin sand and the wells with high pressure and thick sand?

A. Yes, sir. The spread there, Mr. Moody, after what they call the marginal oil, the marginal well oil, was deducted from it—that was better than 90 per cent per well.

Q. They had 40 barrels per well first allocated to the so-called marginal wells?

A. Yes, sir.

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Mr. Moody:

May we offer this in evidence?

Mr. Hart:

I have no objection.

(The above referred to document was thereupon received, in evidence and marked Exhibit 13.)

Q. Now Mr. Hart in his questioning asked you about the potential and its reflecting the capacity of the well to produce. Would the potential of any one of the Wood wells—I mean the potential of any one of the wells on the Rowan & Nichols tract being taken and then the potential on the Wood one acre tract or one-tenth of an acre, whichever it may be, being taken, would those potentials reflect the recoverable oil underneath either tract or the acre feet of sand underneath either tract?

A. No, sir, in no way.

Q. All right. Now, then, with the Wood well, whether it be a tenth of an acre or an acre, producing on this schedule or formula or order that is now in force by the Railroad Commission, one well on either one acre or a tenth of an acre, it doesn't make any difference, and the

adjoining Rowan & Nichols tract drilled to a density of one well to five acres—they are in the same contour up there on the potential map, aren't they?

A. Yes, sir.

Q. The two tracts?

A. Yes, sir.

Q. Does the proration order make allowance for the fact that the Wood well is producing from one well on a lease of one acre and the Rowan & Nichols  
278 lease—each well on that tract is producing in fact from five acres of sand?

A. No, sir, it does not.

Q. Now is there any way they can take their potential map with all of its lines and all of its key wells and under the orders that are now being enforced there give Rowan & Nichols an equal opportunity to get their oil from under their lease—the equivalent of their oil under their lease along with the opportunity they are now giving this man Wood to get his oil or the equivalent of his oil under his lease?

A. Not within the potential they could not.

Q. Now Mr. Hart asked you if the effect of this order wasn't to let some of the people over to the east get more than their part while some of those over to the west didn't get their part?

A. Yes, sir.

Q. And your red line run through there shows that?

A. That is correct.

Q. Now all of the wells to the west of this red dashed line are getting less than the recoverable oil under their leases?

A. Yes, sir.

Q. Rowan & Nichols is in that crowd?

A. Yes, sir.

Q. Have you figured out—what is the scale on this map?

A. There is 2,000 feet to that.



Q. Come over here and figure about how far they are over amongst the crowd that is getting less than they are entitled to.

A. It is 3,000 feet west of the red line to the center of the Rowan & Nichols lease.

Q. All right, everybody to the east of that line is getting more than the recoverable oil under their lease?

A. Yes, sir.

Q. All right, is there any way to correct that or reduce the inequalities of it under the present order that the Railroad Commission is enforcing in that field?

A. No, sir.

Q. All right. Now if I understand your testimony then Rowan & Nichols suffer by reason of the general application of the order to the entire field which results in giving the fellow over on the west more than his part of the oil and also Rowan & Nichols suffer by reason of the fact that under the order a man that is producing from an acre or a tenth of an acre is allowed to produce per acre per day many, many times—some four or five times—as much per acre per day as Rowan & Nichols on their larger lease drilled to a less density?

A. Yes, sir, that is the two things he suffers from.

Q. Suffers from both of those.

A. Yes, sir.

Q. In other fields in this State has the Railroad Commission in fixing and allocating the field allowable amongst wells, have they taken into account acre feet of sand underneath the leases?

A. I don't know of any that have taken into account acre feet of sand.

Q. Sand thickness, then?

A. They have taken in acreage as a factor.

Q. All right, some have taken into account acreage. Is that many or few other fields?

A. Quite a few of the fields have taken in acreage in their allocation formula. I mean quite a number of them have.

Q. Now in those fields is the spacing more uniform than in this field?

Mr. Hart:

We wish to object to any testimony about the method of allocation of any fields.

The Court:

I think you are going a good way afield.

(At this time a short recess was taken, at the conclusion of which the following proceedings were had:)

Q. Mr. Buck, if the wells in the East Texas field were allowed five barrels a day or some such figure, those that were allowed to produce at such a figure, and which if produced daily that amount might cause dead oil to accumulate in the column and produce producing difficulties, if they were allowed to produce that rate, but would produce four or five days in one day, would that eliminate those difficulties of producing dead oil that you testified about in your testimony?

A. Yes, sir.

Q. Now Mr. Buck do you know of any other methods of proration or allocating the field allowable among the wells in the field that could be adopted and which would not create waste and would give an owner the benefit of his advantage in structural position and the benefit of the acre feet of sand or sand thickness or oil reserved underneath his lease?

A. Yes, sir.

Q. Name some of them.

281 A. The acre feet of sand section times the bottom hole pressure or acre feet of sand section plus potential or acre feet of sand section times

potential or a straight acreage plan of proration plus bottom hole pressure corrections, and many others, Mr. Moody, that you could put into an order that would more nearly approach the point that you are speaking of than the present order.

Q. Would any plan of proration that disregards acre feet of sand underneath the lease or sand thickness or oil reserves underneath the lease, disregards those things, will any plan of proration such as that give a man the advantage of his recoverable oil and his position on structure?

A. No, sir, if it disregards those factors it will not.

Q. What will the result be?

A. It will be the taking of oil from one lease or one tract and giving it to another.

Q. Mr. Hart asked you some questions from this sheet here where you calculated the oil reserves underneath this Rowan & Nichols tract of land?

A. Yes, sir.

Q. This is Plaintiff's Exhibit 2. Was that figuring based on the present plan of proration?

A. Yes, sir.

Q. Now, Mr. Buck, have you prepared a device, constructed a device by which you can demonstrate that the present plan of proration will deprive Rowan & Nichols of their proportionate part of the oil or that proportionate part which they bear to the whole, whereas it will give to the folks to the east of their lease many times their proportionate part of the oil?

A. Yes, sir.

Q. Do you have that device in the Court  
282 Room?

A. Yes, sir.

Q. How long would it take you to conduct the demonstration?

A. Possibly five minutes.

Mr. Moody:

I know Your Honor doesn't like demonstrative evidence, but if the Court will permit it we would like to make that demonstration.

The Court:

Why didn't you make it on direct evidence?

Mr. Moody:

The device was not ready at that time.

Mr. Tilley:

It broke and we had to fix it.

The Court:

All right.

Q. Mr. Buck, what are you running into the device now?

A. Kerosene. The device is a replica of the cubical cross section of the East Texas oil field and it has been graduated and calibrated for its cubical content and is being charged with kerosene and water.

Q. The kerosene represents the oil, does it?

A. Yes, sir. I remove the test tubes from the side of the exhibit and then it is quite apparent that the top part of the reservoir is filled with the oil and the lower part is filled with water and it is quite easy to see the oil-water contact in the reservoir. I have a water head. Now when the water reaches the wells the production ceases. That approximately floods the East Texas oil field, as shown in this exhibit.

Q. I don't think it would be necessary, Mr. Buck, to measure it, but when the water strikes this tube does it cease to produce?

A. Yes, sir.

— Q. And so on down the line?

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A. Yes, sir.

Q. Now did you have some difficulty in getting the tubes in the center opened up?

A. That is right. Capillary contraction. Bubbles get in there and it doesn't work.

Q. But did your tubes over to the right fill up with kerosene, more of them than to the left and center?

A. Yes. You will recall we had two full tubes and this much out of the last well. A full tube out of the next to the last and then it comes down in steps.

Q. Which does the right represent, the place where you got the most oil or kerosene out of your device?

A. The eastern side of the East Texas field.

Q. Have you at other times attempted that demonstration and had your tubes open and have it demonstrated that these tubes that are in the part of the device that represents the east part of the East Texas oil field will flow more than the tubes to the center or other end?

A. Yes, I have calculated that error and have run numerous tests on it and figured out the percentage of gain and loss.

Q. Will you state those figures into the record, please?

A. I will give you that, first in cubical centimeters. The oil in place in each of the 8 zones across the field. Zone No. 1 has 27 cubic centimeters. Zone 2—I beg your pardon, Zone No. 1 has 7.29 cubic centimeters. Zone No. 2, 21.8. Zone 3 has 36.4. Zone 4 has 51.08. Zone 5 has 51.08. No. 6 has 36.48. No. 7 has 21.89 and the last one 1.29. In the last test that I ran the first tube did not produce any oil. The water level rose  
284 before there was any production, or any that I could measure. The second tube produced 7 cc of oil. The third 12. The fourth 20. The fifth 30. The sixth 39. The seventh 50, and the eighth 65.

Q. All right. Now those things are equally spaced there and of equal size?

A. Yes, sir.

Q. What is intended to be demonstrated by this device?

A. The model tends to demonstrate the movement of the water from the west and from underneath and displacing the oil from the field and showing the structural advantage and production advantage that properties on the east side have over those to the west.

Q. Does it tend to demonstrate the accuracy of the red line you have drawn as your zero line on this plaintiff's exhibit?

A. Yes, sir.

Q. And your proposition that east of the line they produce more oil than they had in place?

A. Yes, sir.

Q. And those west of the line wouldn't get what they have in place now?

A. Yes, sir.

Mr. Moody:

We would like to have permission, Your Honor, to file a photograph and description of this later on.

The Court:

Yes.

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# Re-Cross Examination.

Questions by Mr. Hart:

Q. Mr. Buck, that experiment you have there illustrates the way the field would act if there was no sand in it, nothing to impede the flow of the oil and water and if the wells were equally spaced and operated on open flow, is that correct?

A. No, I don't believe that that is what the model represents, Mr. Hart.



Q. Well there is nothing in that model to impede the flow of the kerosene and water, is there?

A. No, sir, there is nothing in there to impede it. Of course they are choked with a one-eighth inch copper tubing there.

Q. All of those tubes there they were the same width, inside width, were they not?

A. That is correct, all the same. Each well produced at the same rate.

Q. At the same rate?

A. Yes, sir.

Q. The same rate per well, wasn't it?

A. While it was producing, yes.

Q. While it was producing?

A. Yes.

Q. Well under that method then the man that was here on the west side of the field—say that corresponds to the west side of the field—although he originally had some oil in place, he wouldn't get any out?

A. No, sir, he didn't under that test.

Q. Didn't get any out?

A. Yes, he didn't.

286 Q. As you progressed to the east you got a higher percentage or even more than you had in place?

A. Yes, sir.

Q. That goes to show the structural advantage the leases to the east have by reason of their position on the structure, doesn't it?

A. And by reason of the constant rate of flow from these wells.

Q. And the constant rate of flow from these wells?

A. Yes, sir.

Q. Would that be true under any rate of flow which you adopted, which was constant?

A. Per well?

Q. As between the wells.

A. Yes, sir, it would be true under any rate of flow that was constant between wells.

Q. And those wells were all opened up as much as they would flow, weren't they?

A. Yes, under the hydrostatic head I placed under them.

Q. Not any of them were restricted more than any other?

A. No.

Q. Now in taking into consideration the reserves under the method that you have outlined do you take into consideration the fact of the position on the structure or do you consider just the amount of oil in place under the particular tract?

A. The amount of oil in place under the particular tract has no bearing or very little bearing on the amount of recoverable reserve under a different set of conditions, Mr. Hart.

Q. All right, sir. Now let's take your exhibit there.

A. Yes, sir.

Q. Under the first tract there was 7.29 cubic  
287 centimeters, but no actual recoverable oil?

A. That is correct.

Q. All right, sir, under the second tract there was 21.8 cubic centimeters, but only 7 cubic centimeters of recoverable oil?

A. That is correct.

Q. Well you go on down and get on the last where there was only 7.29 cubic centimeters of oil, but there was 65 cubic centimeters of recoverable oil?

A. Yes, sir.

Q. Is that correct?

A. Yes, sir.

Q. That is the way you would figure recoverable oil?

A. No.

Q. Under the system of withdrawal you mentioned there?

A. Under the system of withdrawal this demonstrates, yes, that is the way; you would have to estimate it.

Q. The amount of recoverable oil?

A. Yes, sir.

Q. In other words you would give to some tracts many times the amount of recoverable oil, many times as much as the oil in place?

A. I wouldn't give it to them, they would produce it.

Q. Then if you are calculating the recoverable oil you would have to calculate that into it, wouldn't you?

A. Yes.

Q. And that structural advantage existed as between tracts before the Railroad Commission took any hand in it, didn't it?

A. The structural advantage of the properties  
288 was there a long time before the Railroad Commission, yes, sir.

Q. Now the density of the drilling as between the Wood tract and the Rowan & Nichols tract in his question assumed that there was a disparity of the density and drilling there. If the Rowan & Nichols tract is drilled to a greater density than the average surrounding areas either if you take a small distance or a large distance or if you take the whole field, then on a density basis Rowan & Nichols isn't at any disadvantage under the present system, is it?

A. Yes, sir.

Q. On a density basis?

A. On a density basis they would have to be way above the average density of the field to take advantage of the movement as I have demonstrated here of that water pushing the oil westward.

Mr. Moody:

Eastward you mean?

A. Yes.

Q. Disregarding that for the time being, we talked about the position on the structure which you said was naturally there. As far as the density is concerned they are not at any disadvantage with the surrounding area?

A. No, I believe the immediate area around the Rowan & Nichols area is approximately the same.

Q. And they have been drilled to approximately the same density as the field as a whole?

A. Close to the same average of the field, that is true.

Q. Won't Rowan & Nichols by reason of their  
289 advantage recover more oil per acre than the surrounding tracts which are not so densely drilled?

A. They will recover more oil per acre than the area that lies to the west of them on the same density or greater density, and they will recover less oil per acre on an even wider—greater density than the properties to the east. That zero line of maximum recovery has to stay on that lease under your present method of allocation.

Q. Is there any method of allocation which would entirely eliminate the advantage of the structure?

A. Not entirely eliminate it, no, sir.

Q. Now if you took—if you wanted to give this first man on the west the amount of oil which was in place under his tract before you started letting the wells flow, about the only way you could do that would be to shut off the wells to the east until he had driven an equivalent amount of oil from under his tract?

A. Yes. We had an oil field in this demonstration. It was completely developed. We started developing at the same time, and so naturally this man from the east took it before the man from the west had an opportunity to get it.

Q. In order to give it to him you would have to shut off the wells to the east?

A. Or choke them down or reduce their rate of flow.

Q. You would have to make an entirely different calculation for each of those wells to the east?

A. Each of them would be in proportion to its reserves.

Q. Well, now as applied to the field which is  
290 now drilled up all over the field from the west to the east, if you are going to allow the man on the west the oil that is in place under his tract you will have to greatly restrict the wells to the east, will you not?

A. If you give him that oil that is under his tract unquestionably you will have to restrict the production of the wells to the east.

Q. That will have to be taken into consideration in restricting the production of Rowan & Nichols and other tracts in the center, would it not?

A. Yes, sir.

Q. To what extent would Rowan & Nichols have to be restricted in order to allow that recovery to be made by the wells to the west of them?

A. That I couldn't tell you.

Q. You couldn't tell us that?

A. No, sir.

Q. Could you give us any estimate on that?

A. I can give you an estimate on it in the amount of reserves under each tract and on a per cent of recovery, but to get all of that oil out of there, instead of restriction I believe we would have to go to shutting the field in there to give it to them or the rate of extraction to the east would have to be necessarily so small I don't believe I could calculate it for you, Mr. Hart.

Q. Let me ask you this one more question.

A. Yes, sir.

Q. The recoverable reserves of a tract are  
291 calculated differently, would be calculated differently by you, depending upon the method of production in the field?

A. Yes, sir, your method of allocation is a function of your recovery.

Q. It would be one thing under open flow, another thing under the present system and it would be still another thing if you restricted the wells on the east in order to allow the wells to the west to get all of the oil under their tracts?

A. Yes, sir, that is true.

Q. Now, Mr. Buck, have you made any calculation of the recoverable oil in place under the Rowan & Nichols tract, if you assumed that you are going to adopt a method of allocation by which you are going to allow to each well substantially the oil belonging to it in place?

A. No, sir, I have not.

Q. You haven't made any calculation of reserves on that basis?

A. Under the Rowan & Nichols tract, yes.

Q. Under the present system of proration?

A. I made a calculation of the recoverable oil. That is two different things, counsel.

Q. The original reserve was the total amount of oil originally in place?

A. That is correct.

Q. Now could you tell us of that oil originally in place what per cent of it was recoverable oil, oil that could be recovered through oil on the Rowan & Nichols tract without migration?

A. My calculation you say?

Q. If you had a method of allocation to restrict the wells on the east so the wells on the west would  
292 get oil in place under their tract or a certain percentage of the recoverable oil in place under their tract? What would you say was the amount of recoverable oil in place under the Rowan & Nichols tract?

A. I gave you a figure of 1,500,000. Now what per cent are we going to be permitted to save? Whatever per cent you say of that 1,500,000.



Q. The only way you could give them 100 per cent of the oil under their tract, assuming it could be brought to the surface, would be to close a section to the east and let the other section produce until it got all it could and then open up another section?

A. To give 100 per cent, yes, sir.

Q. And gradually carry that on east?

A. Yes, sir.

Q. And in order to carry that into effect you would have to restrict those on the east until those on the west had produced their oil?

A. You said you were going to shut them in.

Q. In order to accomplish the result of letting the men on the west get their oil you would have to do that?

A. 100 per cent, you are right.

#### Re-Direct Examination.

#### Questions by Mr. Moody:

Q. Mr. Buck, I started to ask you if this device didn't demonstrate the advantage of structural position, and you said yes. I will ask you if it doesn't also demonstrate how the natural advantage of structural position  
293 where the wells are allowed to take equally from the common reservoir?

A. Yes, it shows the exaggeration of that natural position.

Q. Now another question with reference to this last series of questions as to how you get the oil exactly under each man's place. You are not advocating the closing in of wells in one part of the field until a fellow in another part of the field gets his oil?

A. No, sir, not at all.

Q. Is it your position that orders can be written that will take into account one man's advantage over the other in the acre feet of sand he has and his structural position, that will give him a more equal opportunity to produce oil

along with other lease owners than the order now in force in the field?

A. Yes, sir, that is my contention all along.

Q. And it is your contention that the present order operates to deprive Rowan & Nichols of their property?

A. Yes, sir.

#### Re-Cross Examination.

Questions by Mr. Hart:

Q. Do you have any specific plan, Mr. Buck?

A. I have no specific plan worked out to mathematical accuracy, but I can suggest several.

#### Re-Direct Examination.

Questions by Mr. Moody:

Q. That loss that Rowan & Nichols are suffering is a material disadvantage, isn't it? It is greater than ten per cent of their property, isn't it?

A. Yes, sir, I believe it is.

(Witness excused.)

294 Mr. Tilley:

If the Court please, we would like to offer at this time the order of the railroad commission in Case No. 25,545, which is a denial of the application for adjustment of the allowable of Rowan & Nichols; and the order of April 8, 1938, granting a motion for rehearing on that same order I just introduced.

Mr. Hart:

This is an order granting Well No. 6.

Mr. Tilley:

It is also denying the application.

Mr. Hart:

I see.

(The above referred to document was thereupon received in evidence and marked Exhibit 14.)

Mr. Tilley:

I want to offer in evidence at this time also—although I think under the new rules it is already admitted—the motion for rehearing which is attached to the plaintiff's petition. I now offer the order of April 8th, granting the motion for rehearing, and although I think it is in evidence, I want to be sure.

(The above referred to document was thereupon received in evidence and marked Exhibit 15.)

I think you will stipulate that after the motion for rehearing was granted, and the rehearing was had, that the railroad commission still has the matter under consideration and has not entered any order of any kind?

Mr. Hart:

I think that is correct, Mr. Tilley. If it is not correct I want to be free to offer the true facts.

Mr. Tilley:

All right. We now offer the order of August 29, 1938, Docket Nos. 108 et seq., which is the proration order which we complain of, and the stipulation shows that it is agreed that we made the same complaint to and our petition is so considered as the same complaint to the subsequent orders which are the same as that one. We also offer in evidence Rule 37, which is a spacing rule, as amended, as applied to the East Texas field, which is dated May 29, 1934. We would also like to offer at this time and have it given an exhibit number,

although we do not have a copy here, the order which fixed the first potential for the East Texas field. That is the allowable on an hourly potential basis of the present series, which has been supplemented from time to time.

(The above referred to documents were thereupon received in evidence and marked Exhibits 16 and 17; and the order last above referred to was designated Exhibit 18.)

Now, your Honor, we would like to offer—if I understand the Federal Court procedure properly—the proration schedule of January 1, 1939, if it is agreeable to the parties that in the event either party appeals we will not have to have the reporter copy this schedule, because it is printed, and if it should go to the Appellate Court they might want to have access to it since it refers to almost every well in the field.

The Court:

You can offer it and if there is an appeal taken the Court can direct it to go up as an original document.

Mr. Tilley:

That is fine. We offer that. With the exception of that, subject to my asking permission that my announcement may be withdrawn after I talk to Mr. Moody, the complainant rests.

296 (The above referred to document was thereupon received in evidence and marked Exhibit 19.)

Mr. Tilley:

Complainant rests.

Mr. Hart:

If the Court please, we wish to file a motion at this time for judgment.

The Court:

I will carry it along with the case. I want to hear the evidence.

(At this time a recess was taken in this case until 9:30 o'clock a. m. of the next day, February 8, 1939, at which time the following proceedings were had:)

297 V. E. COTTINGHAM, a witness for the Respondent, having been first duly sworn, testified as follows:

### Direct Examination.

Questions by Mr. Hart:

Q. State your name, please, sir.

A. V. E. Cottingham.

Q. What is your profession or occupation, Mr. Cottingham?

A. I am a petroleum geologist and engineer.

Q. State to the Court, please, what education you have had for that profession.

A. I am a graduate from the School of Geology from the University of Oklahoma; I have had one and a half years graduate work in that school.

Q. After you graduated from the University of Oklahoma what practical training did you have as a geologist?

A. I taught one year in the University of Oklahoma; I was a field geologist doing detailed mapping in Oklahoma, Arkansas, Louisiana, Texas and New Mexico; I have been employed by different companies. The first year out of school I was employed by an individual. After

that employment I was employed by the Empire Gas & Fuel Company at Bartlesville, Oklahoma, with headquarters at Bartlesville, I worked in the valuation department for a few months and then went to El Dorado, Arkansas, in charge of geological exploration in Arkansas. I came to Texas in 1923 for that company as district geologist and worked out of San Antonio in the Balcones

298 Fault district of Southwest Texas and later established an office for them in San Angelo, Texas.

Then I was employed by the Shell Petroleum Company, that was the old Roxiana Company, with headquarters at San Angelo—no, the first headquarters were at Carlsbad, New Mexico. That district was later consolidated with or at San Angelo, and in the capacity of district geologist I had charge of Texas and New Mexico. Later I went with the Exploration Company of Texas as chief geologist and stayed with them eighteen months, and formed a partnership of Cottingham & Brice Company. We did valuation work, we bought and sold royalties and drilled wells. Then I came with the Commission.

Q. When did you come with the Railroad Commission, Mr. Cottingham?

A. I came with them September 1, 1931, when proration became a function of this state.

Q. Had the East Texas field been opened at that time? Had it been discovered and drilled to any extent?

A. Yes, the field had been discovered approximately a year before. The legislature passed a conservation law, and the duties of prorating oil was placed on the employees of the state rather than the companies. I was in that first group to be employed, and my first assignment was in the East Texas field.

Q. Had you become familiar with the East Texas Field before you went with the Railroad Commission?

A. No, I had not.

299 Q. Since you have been with the Railroad Commission of Texas have you made a study of the conditions in the East Texas field?



A. The first nine months with the Commission I was in the East Texas field. Then the next nine months I had charge of the San Angelo district for the Commission. Then the following ten months I was in the East Texas field, making a total of nineteen months in the field.

Q. What generally were your duties when you were stationed in the East Texas field?

A. More particularly along conservation lines, making water surveys, trying to detect leaky casing, and special conservation problems.

Q. Since that time, since the last period that you spoke of, when you were stationed in the East Texas field, what connection have you had with the Railroad Commission and what generally have been your duties?

A. My duties since October, 1935, has been at first I carried the title of chief petroleum engineer for the Commission, and when Mr. Griffin resigned I took his place as what is called as director of production, which position I have held now for approximately three and a half years.

Q. What duties do you have with reference to the East Texas field in your present position, in the position you have held since 1935?

A. I have charge of the engineering as it is carried on in the field.

Q. Have you kept up with the conditions in the East Texas field?

A. Constantly for the last three and a half years.

Q. Have you studied the information which is furnished to the Commission by the operators in the East Texas field, and all other information that is available to the Commission in connection with that field?

A. I have.

Q. Now, Mr. Cottingham, have you here in Court an exhibit showing the general structural condition of the

East Texas field, showing its position with reference to the overlying and underlying strata and so on?

A. I have.

Q. Is that it, this box exhibit here?

A. That is a generalized view of the surface and sub-surface condition obtaining in the Woodbine reservoir, Woodbine Basin.

Q. I don't want to take much time with this, but the top of this box exhibit which you have here in Court shows the surface relation of the East Texas field to the portion of Texas which is around it, is that correct?

A. That is correct.

Q. And this dark green area here indicates the surface position of the East Texas field?

A. Yes.

Q. With reference to the surface?

A. That is correct.

Q. And then the side of this exhibit shows a  
301 cross section of the East Texas field, is that correct?

A. That is correct.

Q. This little black triangular part here represents the East Texas field?

A. That shows a cross section of the Woodbine that is productive of oil. That dark part also shows the original estimated water level.

Q. You haven't undertaken, in this small exhibit, to indicate the variations within the Woodbine sand in the East Texas field?

A. No, the purpose of this box diagram, the field is said to be under water drive, and that is a graphical illustration to show the general mechanics of how the water gets into the basin and the magnitude of hydrostatic head giving rise to pressure.

Q. Have you had prepared photographs of each side of this box which can be introduced in evidence?

A. Yes. I would like to introduce maps illustrative of the top and bottom rather than the box diagram.

Mr. Hart:

We wish to offer those in evidence.

Mr. Tilley:

We would like to have this limitation on it, we would like to have the right to examine it.

Mr. Hart:

Yes, sir.

Mr. Pollard:

Here is a copy of that.

(The above referred to exhibit was thereupon received in evidence and marked Exhibit 20.)

302 Q. Now, Mr. Cottingham—

A. I would like to say that this generalized cross section on the box representing a cross section from the outcrop to the East Texas field was taken from Dr. Plumber's report of the Woodbine Basin and the scales and values there were taken from that report, which is a recognized university publication.

Q. I think the Court is familiar with the general situation in the East Texas field, Mr. Cottingham. We will pass on from that. Now, at the time the East Texas field was first drilled what was the approximate bottom hole pressure in that field?

A. Approximately 1,625 pounds per square inch.

Q. Was that pressure uniform throughout the field at the time the field was first opened, first drilled?

A. It was uniform practically.

Q. In other words, was there any pressure gradient in the field at that time?

A. There was practically none.

Q. In other words, the pressure was practically uniform throughout the field?

A. That is correct.

Q. Now, was the East Texas Field produced at first under a system of limited production or not?

A. No, the field at first was produced at rates—high rates. In other words, they produced them practically at the rates that they could dispose of the oil.

Q. Did that cause any pressure gradient in the  
303 field, Mr. Cottingham?

A. That is correct, as soon as production started then that established a pressure gradient across the field from west to east.

Q. Where were the higher pressures and where were the lower pressures when that gradient was caused by this production?

A. The higher pressures were on the west side of the field.

Q. The lower pressures were on the east side of the field?

A. Correct.

Q. As the field was produced was there or not a drop in the average bottom hole pressure in the field?

A. That is correct.

Q. Now, what was the drop in the bottom hole pressure during the first period in which the field was produced, do you have information on that?

A. I have information so far as four break-downs are concerned. Here one started from the discovery of the well when the pressure—that was the first production, around October 10, 1930:

Q. All right, sir.

A. And from that date to June, 1933, the Bureau of Mines estimated that the field produced \$319,996,000 barrels of oil as the pressure dropped from 1,625 pounds to 1,240 pounds per square inch. This totaled 385 pounds for 319,996,000 barrels.

Q. What was that average drop, then, per million barrels of oil produced during that period?

304 A. The drop was 1.2 pounds per million barrels produced.

Q. Now, have you also calculated the drop in bottom hole pressure and correlated that with the amount of oil produced during the next period?

A. I have figures before me which shows the drop in pressure from the discovery date to December 8, 1938. I didn't bring it to the present time because I didn't have all the figures.

Q. All right, ~~will~~ you give us that?

A. During that approximate eight year period there was a pressure drop of 515 pounds, during which time 1,277,856,000 barrels of oil was produced. The drop, that is the overall drop, from discovery date down to December 8th, this year, totaled four tenths of one pound per square inch per million barrels produced.

Q. Now, have you broken that down to show the drop in pressure from June 10, 1933, up until December 10, 1938, which is approximately the time the present proration order has been in effect?

A. That is correct.

Q. What is that?

A. The Railroad Commission of Texas, through its engineering department, has monthly made bottom hole pressure surveys in the East Texas field since June 10, 1933, to the present time. The original surveys were based on thirty-four key wells, until September 12, 1937, after

305 which time the average bottom hole pressures were computed from ninety-one wells. From June 10, 1933, or the beginning of the Commission taking bottom hole pressures, and we have the map here, this totals five years and seven months. During this time the production has totaled 906 thousand—906,760,000 barrels. The pressure drop at the beginning of the period—the pressure at the beginning of the period

was 1,240 pounds per square inch, and this last December 8th it was 1,106.78 pounds per square inch.

The Court:

What did you say it was?

The Witness:

It was at the beginning of the period 1,240—

The Court:

I have that.

The Witness:

And at the end of the period it was 1,106.78 pounds per square inch, which gives an overall drop during this five years and seven months of 133.22 pounds per square inch. That would—for this period the pressure drop has averaged 147 thousandths. To read it would be .147 pounds per million barrels allowable.

Mr. Moody:

Mr. Hart, may I ask a question? I don't understand. Is that the maximum pressure in the wells where the bottom hole pressures were taken or the average or what?

Q. Explain that, please, Mr. Cottingham.

A. Each month the Railroad Commission takes the pressures on ninety-one key wells, bottom hole pressures, and this is the average pressure for the field that I am referring to here, determined by those various  
306 monthly surveys.

Q. Mr. Cottingham, have you also tabulated the drop in bottom hole pressure during the last fifteen months and compared that with the production of oil during the last fifteen months?

A. The chart should reflect those various periods, these last periods that we have.

Q. Well, go to the chart, then. Do you have that information available there?



A. Yes. During the last fifteen months, from October 12, 1937, to January 8, 1939, the average bottom hole pressure has dropped from 1,118.56 pounds per square inch to 1,106.78 pounds, or the overall drop for those fifteen months totals 11.78 pounds per square inch. During this period the allowable for the total—the allowable for the fifteen month period has totaled 189,747,000 barrels. The pressure drop per million barrels allowable for this period is .062 pounds per square inch.

Q. That is the drop per million barrels of allowable oil?

A. That is correct.

Q. Then comparing these different figures that you have calculated here, Mr. Cottingham, has the rate of drop of the bottom hole pressure in the East Texas field decreased or increased recently?

A. It has decreased.

Q. There is—

A. Per million barrels of production it has decreased.

Q. In other words, there is a very small drop  
 307 in the bottom hole pressure per million barrels of oil produced from the East Texas field under the present system of proration?

A. The last fifteen months it is practically negligible.

Q. Do you have a chart showing the comparison of drop in the bottom hole pressure and amount of oil produced from the East Texas field?

A. That is correct, I have.

Q. Would you please step over here and point out to the Court that?

A. This small chart here is the reproduction of the large chart that is being placed on the board.

Mr. Moody:

Which is that, Mr. Cottingham?

The Witness:

This chart here, the one that the Commission wishes—this is so big and bunglesome, and the small chart will serve the same purpose. This is just a photostat reproduction with the exception of one or two months down here.

Mr. Hart:

I would like to mark this exhibit (marked Exhibit 21).

Q. Now, what is this top red line, what does that indicate, Mr. Cottingham?

A. The top red line shows the average bottom hole pressures for every pressure period, of approximately one month, since June 10, 1933, until January 8, 1939.

Q. The black line indicates what?

A. The black line indicates the daily average production for each of the pressure periods, for each of  
308 the pressure periods.

Q. Of course the black line does not show the cumulative production, just the production for each period, is that correct?

A. That is correct, the daily production, average daily production, for each pressure period.

Q. Does that chart show graphically the facts which you have already testified to with reference to the periods of production in the East Texas field?

A. No, the first period that I referred to was from the discovery date of the field down to the beginning of this chart.

Q. I see.

A. And this chart reflects the date. And I gave it on the other three break-downs.

Q. That is from—

A. And then for the overall picture from the discovery date to December 8th, this chart was taken into consideration for part of that analysis.

Q. In other words, this shows the condition from June 10, 1933, up to December 10, 1938?

A. December 9th, I believe, 1939.

Q. This is 1939 now.

A. Yes. Well, we have that survey.

Q. Up to what date in 1939?

A. That is January 8, 1939.

Q. All right, generally this shows that where  
309 you have the higher production from the field  
you got a drop in the bottom hole pressure, is  
that correct?

A. The pressure drop is accelerated by the amount of withdrawals.

Q. When you get down here to the most recent period where you had fairly steady production from the East Texas field do you find—on here you find what has been the result on the bottom hole pressure in the field?

A. The drop during this fifteen month period, during which time 189,000,000 barrels of oil was produced, has been slightly more than eleven pounds.

Q. Is this exhibit here, which I will mark Exhibit 22, is that a photograph, a reduced photograph of this larger chart?

A. It is.

Mr. Hart:

We wish to offer in evidence the small chart, Exhibit 22.

(The above referred to exhibit was thereupon received in evidence, the same having been marked Exhibit 22.)

Q. Now, Mr. Cottingham, you spoke earlier in your testimony of a pressure gradient which was set up by reason of the production from the field, which was first unrestricted and afterwards under proration. Do you have charts showing pressure gradients in various periods,

showing the variation in pressure from the east to the west side of the field?

A. Yes, we have some pressure maps, one  
310 showing the pressure pattern obtaining in 1935.

Q. Let's mark that Exhibit 23.

A. November 12, 1935.

Q. Now, just explain that please, sir, that Exhibit 23.

A. This map shows the pressure pattern obtaining as of November 12, 1935. The high pressures are on the west and the low pressures are on the east. The isopiestic lines, or lines that connect points of equal pressure are in fifty pound—are fifty pound lines.

Q. All right, sir, the next one was this Exhibit 24.

A. It is a pressure map, bottom hole pressure map, reflecting the pressure pattern as of January 12, 1936. It is almost similar, the pressure pattern is almost similar to the previous one, as will be noted from the colored bands.

Q. Now, what is this relief map you have here. What period does that show the pressure gradient in the East Texas field?

A. That shows the pressure gradient as of September, 1937, and the purpose of showing it in that manner was to give a better idea of what is meant by pressure gradient. The pressure gradient in the south end of the field is very high. The pressure gradient in the north end of the field is very low.

Q. Mr. Cottingham, at this point could you explain to the Court how it is that although the average pressure throughout the field was approximately the same at the  
311 time the field was first opened, that the pressure gradient has been so upset that there are portions of the field very much lower in bottom hole pressure than other portions, why that grades off from west to east?

A. In order to have flow it is necessary to have pressure differential. The motivating force that pushes the oil

in the bore of the well in the East Texas field is water-drive, as demonstrated by this exhibit number whatever it is.

Q. The box exhibit?

A. The box cross section of the East Texas field. In other words, the original pressure was derived from hydrostatic water. The water itself under that pressure moves into the reservoir, partly down through the outcrop, but more particularly the immediate effect is the expansion of the water as the oil is withdrawn. As the oil is withdrawn the water encroaches. The oil in the reservoir has a coefficient of expansibility, and when you take oil out of the reservoir this water which was originally under a pressure of 1,625 pounds per square inch started moving in and maintaining that pressure. In order to get flow it is necessary, though, to have differential in pressure, so as the water out in the reservoir, having more pressure, as the oil was withdrawn, than the oil in the oil reservoir itself, that set up pressure gradients from the direction of the source of the pressure to the east side of the field.

Q. Mr. Cottingham, is the East Texas field a  
312 homogeneous sand? That is, is it all the same character (are there variations in the sand, in porosity and permeability, and also do you find lenses of shale and things of that kind which would cause a— cause pressure gradients to be set up?

A. The East Texas field extends over an area of forty miles from north to south. We find variable conditions with reference to the character of the formation which is productive of oil.

Q. Explain how that would cause this pressure gradient to occur. In other words, is the East Texas field a reservoir like the exhibit introduced yesterday where the oil and the water flows freely?

A. No. 7

Q. Or where the oil flows more rapidly in some portions of the field than others?

A. In the north portion of the field the sand conditions are more uniform. They have a high order of permeability and the pressures from the west to the east can be transmitted through the oil body much more rapidly than it can in the south because of that condition. In the south part where you have a great deal of shale intermixed with the reservoir rock shale and impermeable volcanic ash the pressure can't be transmitted through that entire body with the ease that it can up in the north end. Therefore, on the south—on the extreme east portion of the south end of the field the pressures become much lower  
313 than they do on the west side in that area. The rates of withdrawal are such that the pressures

on the east side can't be maintained. In other words, the pressure can't be transmitted throughout the oil body.

Q. Do those same variations exist to a less degree in the north as they do in the south?

A. The north end of the field is much more uniform in the general permeable condition of the field.

Q. I will mark this Exhibit 25. Do you have another chart?

The Witness:

Mr. Hart, if the Court will permit me?

The Court:

Yes.

The Witness:

I didn't mean to present that as an exhibit.

Q. Can you reproduce it on a chart?

A. We have one here which reflects practically the same thing.



The Court:

The only use you would have for it would be to transmit it to the Circuit Court, and I am sure they would let you bring it back right away. They don't want it around and I don't want it here, so it is just a matter of a few days, unless you have some constant use for it.

The Witness:

We have no constant use for it.

The Court:

Let it go in, then.

Q. I will ask you to look at Exhibit No. 26 and state to the Court what that shows, Mr. Cottingham.

A. Exhibit 26 is a bottom hole pressure map of the East Texas field, reflecting the pressure pattern as of January 8, 1939.

Q. It shows the same gradients from west to east as the other charts, is that true?

A. No, there is a difference. If you will note here you have four bands. The map of 1935 has four bands. The chart of 1936 has four bands across the middle part of what is commonly known as the Gladewater Nose. Over here the pressure pattern has become more—the gradient is less from west to east. In other words, the gradient here has decreased during the last few months.

Q. What is the difference in pressure between the first section that you have on the west and the last section on the east, in that portion of the field?

A. The blue shows from 1,150 to 1,200, and the red in each case of these 1935, 1936 and 1939 charts, the red dash red is between twelve and twelve hundred fifty pounds per square inch. It shows the travel of the 1,200 to 1,250 pressure from east to west. In other words, this 1,200 to 1,250 is over here. Now it is a little closer here in 1939 to the west side, and here it is almost off the map,

showing the travel of that particular pressure band, that it has moved from east to west.

Q. Are you familiar with the location of the Rowan & Nichols B Todd lease which is involved in this case?

A. I am.

Q. Do you know in which pressure contour that lease falls in the most recent map, that is, Exhibit 26?

A. It falls between the 1,100 and 1,150 pound pressure band or zone.

315 Q. Now, Mr. Cottingham, is the sand, is the Woodbine sand in the East Texas field of uniform character or not?

A. It is not.

Q. Would you explain—

A. If you take the field as a whole, and that is necessary when you apply a common yardstick across it in proration.

Q. Would you explain the different characteristics that you find in the Woodbine sand throughout the different sections of the East Texas field?

A. As previously pointed out, the north end of the field, more uniform conditions obtain than in the south end. You take the pressure patterns of those various maps reflect the very permeable condition in the north end of the field, and in the south end a very tight, impermeable condition, either occasioned by shaling up a part of the section or tighter sands.

Q. Would you explain about the shale, please, how the shale lenses occur in the East Texas field and explain what influence, if any, that has on the amount of recoverable oil that can be taken out of the field in the various portions of it?

A. The Woodbine formation from its outcrop, as reflected on this exhibit number—this box exhibit, the top of it shows the outcrop of the Woodbine. From its outcrop to where it pinches out against the Sabine Uplift is variable in character. It was laid down in a shallow

316 water condition. We know that it is of marine nature because it contains marine fossils; we know that it is of shallow origin because it contains a considerable amount of lignite. The reservoir itself is—where it pinches out, is said to be pinched out against the Sabine Uplift—is a truncated portion. In other words, you have a thickness of the Woodbine there and then under sea conditions it was truncated. Now, the reservoir itself is made up of a succession of sand lenses, shale lenses and volcanic ash. The shale is impermeable and has a very low order of porosity and permeability, such that fluids would not move through it. The volcanic ash is practically of the same order of permeability and porosity. That is, it is a very low order. The sand itself is composed of—in certain portions you have the clean sorted sands; in other places the sands shale up. So generally speaking you might say that the reservoir rock is a succession of shale, volcanic ash and sand lenses intercommunicated.

The Court:

Pardon me, Mr. Cottingham, but what does this black represent?

The Witness:

May I point it out to you?

The Court:

Right there.

The Witness:

That represents a cross section through the Van field, the black portion.

The Court:

This dark red is the Woodbine sand?

The Witness:

Yes, sir.

The Court:

That is the outcrop over towards Dallas?

317

The Witness:

Yes.

The Court:

That is where you say it pinches out on the Sabine?

The Witness:

Yes, sir.

The Court:

Now, where is this East Texas field, right along here?

The Witness:

No, the other place.

The Court:

Here?

The Witness:

Yes, sir. Now, if you will take a pencil and go on up you will see that it is just across from the East Texas field. It is on top of the map.

The Court:

I see. But what does this black represent?

The Witness:

The black represents the saturated portion and the bottom of that represents the original water level at minus 3,320 feet. This Van saturation portion, that occurred above minus 2,500.

The Court:

What is that?

The Witness:

That is this field along this cross section from A to A'.

The Court:

All right, thank you.

Q. Mr. Cottingham, that box exhibit gives an exaggerated idea of the extent of the Van field when you look at it on the cross section, does it not, because the Van field is a smaller area?

A. The Van field covers approximately 4,400 acres, but the maximum thickness of the Woodbine is 650 feet. It is a very small, deep seated salt dome.

Q. Mr. Cottingham, you were speaking of these  
318 shale lenses and volcanic ash lenses in the East Texas field. Are they laid down horizontally or are they generally laid down at somewhat of an angle from horizontal?

A. They were originally laid down—all sediments have a depositional gradient, but for all practical purposes the gradient is very low and practically parallel to the bedding plains within the formation.

Q. At the present time are those sand lenses horizontal or at an angle with the horizontal?

A. With reference to the reservoir?

Q. No, with reference—

A. In the East Texas field?

Q. With reference to horizontal are they tilted up? The sand is some what tilted up. Are the shale lenses tilted up in the same way in the East Texas field?

A. The shales are some what tilted up, yes, but they are not of the order of the roof of the structure because the roof of the structure is an erosional plain, or erosional surface, not a plain.

Q. Would you mind coming over here and taking a map showing the cross section of the field and show how those lenses occur?

A. The top or roof of the structure reflects an erosional surface. The bottom of the Woodbine section of the reservoir reflects more nearly a condition obtaining when the sediments were laid down. The yellow stream here is

319 the Del Rio shales which averages—it thins from west to east somewhat, but is more constant in general thickness than the reservoir rock itself.

The shales, shaled edges and sand lenses in the reservoir rock more nearly parallels the base of the reservoir than it does the north part of the reservoir. Therefore, when this truncation took place shale lenses are at an angle to the roof of the structure and intercept that erosional plain.

Q. Do the shale lenses occur regularly throughout the field or do they occur irregularly?

A. Irregularly. Any sediments laid down under water, particularly for long distances, have irregularities of shale and sand.

Q. Do you have any way of telling exactly how—

The Court:

What importance do you attach to those shale lenses? What significance do they have to you in promulgating a plan over there?

Mr. Hart:

Explain that, Mr. Cottingham.

The Court:

How extensive are they, to begin with? How big are they?



The Witness:

Sometimes they are a few inches thick, sometimes eight or ten feet thick, an impervious material. In figuring out—

The Court:

That would mean the fluid would have to find its way around it?

The Witness:

Yes, sir. In figuring out the reservoir content it would be somewhat difficult unless you had all the  
320 facts before you to know how much content you had to figure with all this mass of volcanic ash and shale lenses in the reservoir rock. That is one thing. Another thing, with reference to spacing, if one of these pronounced lenses intercepts the roof of the structure, then if a well isn't there at a particular point to penetrate that, as the water comes up, then that will be trapped in that whole structure just like it is trapped here in this large structure and it will never be recovered.

Q. In other words, Mr. Cottingham, you can't take a given cubical content of the East Texas field and say there is that much recoverable oil in it, is that correct?

A. No.

The Court:

As I understand it there have been about 25,000 wells completed over there, is that right?

The Witness:

25,000. It is almost 25,900 now.

The Court:

Have you any offhand record—I don't mean to hunt it up—but just approximately how many dry holes there are?

The Witness:

Mr. Hudnall has that.

Mr. Hudnall:

Twenty-five inside the field.

The Witness:

Twenty-five he says. We counted it up.

The Court:

Every other one in the 25,000 has been a producer?

The Witness:

That is right.

Q. Mr. Cottingham, do you have any information available which would show the location of the thickest of all of those volcanic ash lenses or shale lenses throughout the East Texas field?

321

A. No, I have not.

Q. Could you by calculating the cubical content of any area tell with any certainty how much of that cubical content is shale or volcanic ash?

A. No, you can't.

The Court:

I still don't catch the significance. I suppose it has some significance, but as I understand it the first point you make is you have to determine the amount of this shale there, the light it would throw upon the content of the reservoir?

The Witness:

That is right.

The Court:

All right. From a standpoint of conservation or prevention of waste what has that to do with it? What difference does the fact it is in there in the sand make? Does the fact that you take this oil out at a rate of twenty barrels a day or a hundred barrels a day or two hundred barrels a day have any relationship to the fact that there you have these shale lenses?

The Witness:

Yes.

The Court:

What is it?

The Witness:

You take shale lenses in tight sands, if there is a gradual encroachment of the water then the pressure is applied against that oil-water contact and there is a more general flushing of your oil around your shale lenses and through your less permeable sands.

322

The Court:

With what result?

The Witness:

What is that?

The Court:

I say with what result?

The Witness:

With a greater ultimate recovery under low rates of withdrawal than under high rates, that is one thing. Another thing with reference to the spacing of wells, with reference to getting more oil ultimately, that if you drill

your wells, if you have a general uniform spacing which—then you will get more oil.

Mr. Moody:

May it please the Court, I think your Honor has one thing in mind and Mr. Cottingham another. Mr. Cottingham is talking about a total daily field allowable. I think your Honor is talking about allocation between wells.

The Court:

You can bring that out. Have you decided whether you get bigger recovery with lots of drilling or less drilling?

The Witness:

I think you will get some more oil with lots of drilling.

The Court:

Denser drilling?

The Witness:

Yes, sir, but I don't know how much.

The Court:

You used to testify that if left to its own devices one well would drain its own tract, you didn't need a lot of wells.

The Witness:

I have some very definite views with reference to spacing. I believe in spacing that it prevents fire hazard, loss of life and property; second, it prevents blow-outs, and that is important in the State of Texas because we have several serious blowouts now. And then it affords a uniform spacing pattern and protection of the reservoir generally, and it better utilizes the gas energy in gas drive fields. And with reference to the exception to a spacing rule—

The Court:

I don't understand that the spacing rules are under a particular attack here now in this case. They are not under attack here now, are they?

Mr. Moody:

No, sir.

The Court:

What they say is that in giving them their allowables you don't take into consideration the size of their acreage or the amount of oil they have under their ground and that they can establish that they have so much more than you allow them in comparison with other people who have less. That is a very specific attack, and I don't know to what extent it is refuted by all of this enormous amount of information about the East Texas field. It is very interesting, of course, but—

Mr. Hart:

May I explain to the Court how—

The Court:

Of course I am always at a disadvantage because I have been through this a great deal, but I am not the only Judge that may have to pass on it. Two or three Judges may have to pass on it who haven't had anything to do with it, so I will let it go in the record if you want it.

The Witness:

From an engineering standpoint, if I am going to have to do the calculating and someone says "Here it is, 324 you figure it out, figure out the reservoir content and how much oil every man is entitled to," and with the data that we have to work with it is a terribly big job.

The Court:

I can understand that. All right, go ahead.

Mr. Moody:

May it please the Court, I don't want to be in the position of objecting to a question the Court asks—

The Court:

I was more or less thinking out loud.

Mr. Moody:

But we don't want to be bound by his statement that the more wells that are drilled the more oil.

The Court:

They have been disputing about that ever since I have been on the bench.

Mr. Moody:

Yes, sir, I understand. The reason we object to that being part of the record by which we would be bound is because the Courts have held that is a collateral attack upon the rules of the Railroad Commission, and I think the Railroad Commission specifically stated in one of their orders that they don't mean that the more wells that are drilled the more oil recovered, but that the more that are drilled in conformity to their spacing rules, and we just wouldn't want to be bound by that.

Mr. Hart:

Of course, part of the spacing rule is the Commission  
 325 can grant exceptions to Rule 37 to prevent waste  
 and prevent confiscation of property, isn't it?

A. Yes, sir.

Q. And under the present system of proration that assigns the allowable on the basis of potential per well, you do encourage a man to drill into an area where if



you have one of these shale lenses he will recover oil which otherwise wouldn't be recovered?

A. Yes, sir.

Q. Therefore, there is a definite relation between—

Mr. Moody:

We object to that. That is an argument of counsel.

The Court:

That is more or less provoked by the Court's questions. I was trying to direct him into a little narrower channel if I could, but I have to let them set their background if they want to.

Q. Now, you spoke, Mr. Cottingham, of the irregularities and characteristics of the sand within itself in the East Texas field. Now, are there also irregularities in the top and the bottom of the East Texas—of the Woodbine sand in the East Texas field?

A. That is correct. That is reflected in sections—the five sections—six sections.

Q. Let me mark those first. This Exhibit 27 shows a surface map of the East Texas field, and the red lines indicate the places at which these cross sections were taken, is that correct?

A. That is correct.

326 Q. There is a longitudinal section here which is shown by—what is that shown by the longitudinal line running through the field?

A. That is in here some place. That is a north-south cross section.

Q. That is shown on Exhibit 28, is that correct?

A. That is correct.

Q. And then you have taken some cross sections of the field at the various points where the horizontal lines are shown on Exhibit 27?

A. That is correct.

Q. All right. Now, the cross section A to A is shown on Exhibit 29, is that correct?

A. That is correct. That is the cross section that runs near the Rowan & Nichols Todd B lease.

Q. The cross section B to B is shown on Exhibit 30, is that correct?

A. That is correct.

Q. The cross section C to C is shown on 31, is that correct?

A. That is correct.

Q. Cross section D to D is shown on Exhibit 32?

A. That is correct.

Q. Cross section E to E is shown on Exhibit 33, is that correct?

A. Exhibit 27 you mean?

Q. The cross section E to E is shown on this Exhibit?

A. Yes.

327. Q. Now, from what were those exhibits made up, Mr. Cottingham?

A. These exhibits were made from Schlumberger logs. They reflect the top of the reservoir, the original estimated water level at minus 3,300, and where the wells encountered water, it shows at what depths those wells encountered water.

Q. Do these cross sections show or not that the top of the Woodbine sand in the East Texas field is irregular and therefore it would be very difficult to calculate the cubical content under any particular lease?

A. That is correct.

Q. Do they also show that the rise of the water level has been irregular in various portions of the field, and for that reason it would also be difficult to calculate the cubical content of the saturated sands in the portion where the water has risen?

A. That is correct, as reflected in section A-A. The original estimated level is shown in this straight line here, but the water encountered on the Schlumberger logs are

dotted as indicated here, showing that the water in this well was very irregular. Likewise in section B-B five wells encountered the water, and it doesn't show that the water is at a level plain. Section C-C shows that the water table is boned up as the dotted line indicates. There was no water—there is no water indicated from the Schlumberger logs on section D-D, but on Section E-E it shows the water level as indicated by the dotted line.

Q. You also have another exhibit here.

A. The longitudinal section shows two wells on the north end which encountered water, and the water from those wells—those wells were recently drilled wells—the water level is shown by this dotted line running in that way. On the south end the Schlumberger water level is inclined like this. The estimated original water level is indicated by the minus 3,320 foot line.

Q. You have another exhibit here taken on a cross section across the north end of the field showing the irregularity in the water level in that portion of the field?

A. That is correct.

Q. That is Exhibit 34. Now, what is this level line that is drawn all the way across the map, what is that?

A. The dark blue area indicates the portion of the—that is below minus 3,320. The light blue indicates the portion or section of the reservoir that is above minus 3,320 to the total depths of the wells indicated.

Q. What does that show with reference to the rise of the water table in that section of the field as to whether it is a uniform rise or whether it is irregular?

A. That shows that—the brown shows the penetration of each well into the Woodbine section. All of these wells are making water, so it is presumed that all of them have water at or near their total depths because they are making water. They are bound to have water there. So it shows that the water level in that area is very irregular.

329      The Court:

What section of the field is that in?

The Witness:

That is through this part right there.

The Court:

How far is that away from the Rowan & Nichols lease?

The Witness:

The Rowan & Nichols lease is here, but this condition obtains throughout this west margin where you have water.

The Court:

You have water all towards the west?

The Witness:

Yes, sir, west and north, it skirts around here.

Mr. Moody:

May I ask a question, Your Honor?

The Court:

Yes.

Mr. Moody:

Is that a cross section east and west?

The Witness:

This?

Mr. Moody:

Yes.

The Witness:

It is a cross section through this portion of the field here. That is an east-west cross section, yes, sir.

Q. Now, that is somewhat north of the Rowan & Nichols lease, is it not?

A. Yes, it is north of the Rowan & Nichols lease.

Q. Now, the water, in order to explain the point Mr. Moody asked about, the water encroaches along the west and also from the north and south to some extent, is that correct?

A. That is correct by reason of the general  
330 outline of the field.

Q. This particular map shows, does it not, that the top of the sand along the western edge and along the northern edge of the field is low, and it gets higher as you go towards the south from this point and also as you go towards the east?

A. Yes; that is the structure map drawn on the top of the Woodbine sand.

Q. And the purpose of this exhibit is to show where water has come into the field it has come in at irregular levels as between wells, is that correct?

A. That is correct, and that it has not risen along in a level plain.

Q. Will you explain to the Court why it is that the water level has not come in flat like that, as a flat table, but has risen to different heights in different areas there?

A. The permeabilities of the sand have something to do with it.

Q. The presence of these shale lenses or volcanic lenses also have something to do with it?

A. That is correct.

Q. In other words, if you are going to calculate the water, disregarding your—you are going to have to disregard the actual variations as existing between tracts?

A. That is right. In other words, if you try to calculate the cubical content of this area here we would have this condition obtaining, and I don't know just how to do it.

331 Q. Now, on this Exhibit No. 35 here, Mr. Cottingham, will you explain to the Court what that exhibit shows?

A. Exhibit No. 35 is a sub-surface contour map referring to the top of the Woodbine sand. It is contoured on twenty foot contour intervals. It shows that the east side of the structure is high and the west side is low. It is an irregular surface as reflected by these contours.

Q. Does that map show all of the irregularities that would occur between tracts, or just how far—how much difference in height is there between each one of those contour lines?

A. The scale of this map, I think, is one inch, one inch equals 1,000 feet. One inch equals 2,000 feet. The contour interval is twenty feet. That is a low area and here you have a salient high area. This is a high area and this is a low area, high area, low area and high area. Here you have a projection going out here. That is a low area running in some three or four miles there. This salient sticking out here is about 3,000 feet.

The Court:

As I understand it, that is a contour of the Woodbine sand?

The Witness:

Yes, sir, it delineates the top.

The Court:

The top?

The Witness:

Yes, sir, how it looks on twenty foot contour intervals.



Q. If you tried—

332 A. If it was a plain these contour lines would run regular right down like that, but it is not a plain, it is an irregular eroded surface.

Q. If you tried to allocate the production according to the cubical content of the sand thickness of each tract of the Woodbine section, under each tract, would you or not have great difficulty in ascertaining what the top was to begin your calculations, the top of the Woodbine sand?

A. The best you could do would be an estimate of what that would be. You can't calculate an area that way accurately. All you can do is try and strike a happy average.

Q. Would that in some cases do as much—would that vary as much as twenty feet, you might be off twenty feet or possibly more than that in calculating the top of the Woodbine sand?

A. I believe a variation of the top varies thirteen feet, and there are variances in this area here which are much higher than this area here.

Mr. Tilley:

How much did you say, Mr. Cottingham?

The Witness:

I think thirteen feet the testimony was yesterday. I was taking that, that is my source of information.

Q. Well, a method of allocating the allowable on such a basis as that would necessarily be inaccurate, would it not?

333 A. It would be inaccurate. In other words, before you can figure the cubical content of your reservoir, the effective porosity, you have so many factors. First would be the top, the regular top and the regular bottom and the impervious sand and shale lenses in the reservoir itself.

Mr. Tilley:

If the Court please, in order to make an objection, I would like to ask the witness a question. Are you testifying now that there is a variation between those two sands? Is that your testimony?

The Witness:

Between which two sands?

Mr. Tilley:

Between the contours there.

The Court:

He is testifying the contour of the Woodbine sand—his testimony, as I understand it, is that it is very irregular in the distance from the earth's surface.

Mr. Tilley:

Are you basing that testimony on your actual experience in taking Schlumbergers or is it hearsay with you? Who made the map there, might I ask that?

The Witness:

Mr. Hudnall.

Mr. Tilley:

Now, have you taken Schlumbergers out there?

The Witness:

But if you will permit, I have a map that I got in confidence from a major company and they asked me to keep it in confidence, and I shall. And then we have other published reports of maps of the East Texas field, and I have very carefully checked my data with this and I find it is substantially all about the same. It is not very difficult to make one of these.

334 Mr. Tilley:

But, Mr. Cottingham, you yourself, from core examinations or Schlumberger tests or records or logs that you have been shown, you have not compared that map with those logs or cores?

The Witness:

No. Here we have records of 25,000 wells, and I don't know how many, possibly four or five hundred Schlumbergers have been run in the East Texas field. We have much better control here—

Mr. Tilley:

That is not my question, Mr. Cottingham. I am asking you have you compared that map with these Schlumbergers, the logs themselves or the cores?

The Witness:

No, I have not.

Mr. Tilley:

If the Court please—

The Witness:

I have examined the Schlumberger logs here.

The Court:

Who made that map? Mr. Hudnall made that?

The Witness:

Yes, sir.

The Court:

How did he make it? Was it made under your direction and supervision?

The Witness:

No, it was not.

The Court:

Where was it made?

The Witness:

It was made, I presume, at Tyler, Texas, but I did check it.

The Court:

Do you know enough about its authenticity to use it as a basis for your testimony?

The Witness:

I think so because I have other maps of the East Texas field, and it is substantially—they are all substantially the same.

335 The Court:

In determining the height of that Woodbine sand, you do that by these various wells as they are drilled into it?

The Witness:

Yes, sir.

The Court:

Do you have to have a Schlumberger test to do that or can you get that from cores?

The Witness:

You can do—

The Court:

Do you know you hit the Woodbine, without Schlumbergers?

The Witness:

You can get it from the driller's core because the formation is different between the Austin Chalk and the Woodbine.

Mr. Tilley:

Your Honor, the testimony puts us in a position where he can testify to those matters, but on cross examination we can't ask him questions because he will say he didn't know.

The Court:

Suppose he does? It will affect the weight of his evidence, but there is never applied to these big oil fields the technical rules which ordinarily would apply, you can't do it. What your engineers and the other engineers know about it, it is very competent learning. They go around and find this about this, well and that about this one, and then they draw their conclusions and then get a composite picture. If you are going to apply the technical rules of evidence to it you would never develop the facts with regards to a large oil field.

336 Mr. Tilley:

We didn't want to be technical, Your Honor.

The Court:

Mr. Buck, everything he testified to he didn't know of his own personal knowledge, he got it from records and what men told him and studies that had been made, and in the last analysis, when you get to trying to find out what there is down three or four thousand feet in the ground, there has to be an element of uncertainty, so I will let him testify.

(At this time a recess was taken, at the conclusion of which the following proceedings were had:)

Q. Mr. Cottingham, in connection with your testimony about the irregularities of the water in various wells in the East Texas field have you prepared a tabulation showing the total depths of the wells which are making water, and showing the percentages of those wells at the various subsea depths?

A. Yes, sir, I have.

Q. Do you have one of those schedules?

A. Yes.

Q. Would you explain that tabulation, please, to the Court?

A. This tabulation shows a break-down of the wells in the East Texas field, of 3,036 wells that are making water in the East Texas field on this date, and it was compiled from the Commission's October 1st water report, and this data with reference to water is compiled each quarter. The operators turn in data under—sworn to—and it was from that data that we got this information here. We asked them to give us the top  
337 of the sand and the penetration and the total depth of the well. The tabulation shows here the total number of wells, as of October 1, 1938, making water in the East Texas field. This totalled 3,746. There was 701 wells in the total amount that we could not use because some of the operators didn't know where the top of the sand was or didn't know the total depth. All they knew was the well was making water. So this is only taken from those operators' reports who knew where the top of the sand was, the penetration and the total depth. Over on the column Total Depth all of those figures refer—are minus values, or the values below sea level. This shows that there are forty-one wells in the East Texas field producing water with a total depth of minus 3,270 feet. That is fifty feet above the original estimated water level. It shows thirty-nine wells producing at forty-five feet above the original estimated water level. It shows sixty-seven wells pro-



ducing forty feet above the original water level, and so on down. There are ninety-seven producing thirty-five feet above; 158 producing thirty feet above; 170 producing twenty-five feet above; 232 producing twenty feet above; 380 producing fifteen feet above; 422 producing ten feet above.

The Court:

You are practically reading this schedule?

The Witness:

Yes, sir.

The Court:

I have glanced at it.

338 The Witness:

This schedule was designed to show where the wells are making water. That is, it shows what the total depth is and the well is making water, we know there is water at least around these particular wells at those various levels from fifty to—as high as fifty feet above the original estimated water level. Now, below the line it shows possibly 400 wells producing below the estimated water level. In other words, on the righthand side it is a cumulative percentage of the wells and it shows—you can look across from the cumulative on the righthand side of this tabulation and see how many wells are producing or what per cent of the wells are producing above or below a certain level.

Q. Mr. Cottingham, all of these wells are producing oil, are they not?

A. Yes.

Q. And they are producing some water with it?

A. Yes, sir.

Q. And some of them are producing water from as high on the structure as minus 3,270 feet and others

are producing oil together with water from as low as minus 3,340 feet, is that correct?

A. Yes, they are producing oil and water.

Q. Then that shows a variation in the water table between these various wells of about seventy feet, is that correct?

A. I believe when you refer to a water table you refer to—well, it would be a water table.

Q. Well, I intended to say water level in the particular wells, I don't mean the water table generally, but the particular wells?

A. That is correct.

Q. It shows differences as much as seventy feet?

A. Yes.

Q. Those variations between wells as to the water level, is that due to the variations in the permeability and character of the sand in the Woodbine section that you have already spoken of?

A. That is correct, and unequal withdrawals.

The Court:

What is the last thing you said?

The Witness:

I say that and unequal withdrawals. That is, if you have more oil pulled out you will change the water table.

Q. If you have a system of proration and there is an equal spacing of wells, a general equal spacing of wells and withdrawals, that won't take place, will it, if you have a uniform spacing of wells and a system of proration allocating the production among the wells on the present basis, you cut down on that disproportionate withdrawal, do you not?

A. I don't believe I get your question, Mr. Hart.

Q. Well, you spoke of these disproportionate withdrawals. Did that take place before proration went into effect?

A. Oh, yes, much more pronounced before proration than it has been since proration.

340 The Court:

Do you mind if I interrupt him, to ask a question?

Mr. Hart:

Not at all, sir.

The Court:

I suppose you assisted in preparing this order?

The Witness:

No, I did not, Your Honor, I had no—I have prepared many orders since then, but not the original order.

The Court:

I know, but have you prepared others based on it?

The Witness:

Yes, sir, under the direction of the Commission.

The Court:

Is it your idea that you should take the total reservoir, like this, and attempt to withdraw equally from it, from all wells, without giving any consideration at all to the question of certain wells being better wells than others or whether certain owners happen to be fortunate in being in a good position on the structure, in order to get for the general public the good out of the field?

The Witness:

I think if you take it under the conditions obtaining now the present scheme is the best.

The Court:

That is what I want to know.

The Witness:

But if you had asked me that six years ago, or five or six years ago, and had I had the experience back of me then that I have now, I would have given you a different answer.

The Court:

Is it your ultimate purpose to attempt to recover from this reservoir all that can be recovered, without respect to how you recover it or who recovers it?

The Witness:

I think there should be a somewhat fair allocation made between owners, those that own more should get more, but the condition obtaining there now—

The Court:

How does your order affect that?

The Witness:

Which?

The Court:

To allocate to the respective owners the benefit of their superior position?

The Witness:

All right, the time element is going to take care of them ultimately, and in my opinion they will get substantially what is coming to them.

The Court:

By reason of the fact that they are last?

The Witness:

That is right. When you apply a common yardstick, any method of proration—across more particularly a field of this magnitude—somebody is going to be hurt, but in the ultimate the better areas will produce longer and the time element will take care of it, as evinced by the fact we have in Texas 251 wells now on a per well basis, and none of those orders have ever been attacked.

Q. 251 fields you mean?

A. Yes, sir.

Q. Mr. Cottingham, on that point the Court was just talking to you about, will you come and use the Exhibit 35, which is the structural map of the East Texas field, and show how the Rowan & Nichols lease will  
342 benefit by this method of proration in that their production will be much longer than the production of other areas in the field?

A. The highest part of the East Texas field is this color, it is kind of a pinkish. Then this next highest portion is the blue along the south end. The next highest portion is the green, and you will notice there are some green just east of the Rowan & Nichols tract. The red is between contours minus 3,180 and minus 3,160. The area that is now higher, the highest portion of the field, is fast approaching a depleted condition. It is that area in which Mr. Buck referred to as making an estimate on some wells. These wells are all on the pump and our largest amount of abandonments are in that area.

Q. Explain, Mr. Cottingham, why that is going on the pumps and being abandoned even though it is higher on the structure.

A. They are being abandoned and going on the pump as reflected by this East Texas pressure map. The permeability is very low, and in as much as the motivating force is waterdrive, and it can't be transmitted to the sands on the east side there they recover the oil practically on a gasdrive situation, and the only gas in the oil originally was about 350 cubic feet to the barrel, so they will be the first to go out of the picture. Now, that condition, most of the wells that are being abandoned and most of the wells that are being placed on the pump are in this area here. They are in an area of low permeability, far removed from your waterdrive. But along here, along the Gladewater Nose, it will be noticed that the pressure gradient is almost level. There is not so very much difference in the pressure on the east side as there is on the west side. The conditions of the sands are so permeable that the water can transmit its pressure clear across in a very short time.

The Court:

Well, do you think the benefit, as I understand it, to these people is they will be able to get oil longer?

The Witness:

They will get oil longer, yes, sir.

The Court:

And now the fact is, of course, that they have reserves under their land, is it?

The Witness:

Yes, sir.

The Court:

Does that make any difference, whether they get it in a longer or shorter time? And isn't there a risk if you



drag it off too long they may be drained off to the east by other people, the waterdrive to the west coming up on them?

The Witness:

The waterdrive. I think I can show here that by the waterdrive that this will be the last area to go out of the picture in the East Texas field, and I think I can show that they have as much reserve under their land today as they originally had.

The Court:

You mean by drainage from other tracts?

The Witness:

Yes, sir. They have taken out of that twenty-four acre tract about 356,000 barrels.

344 The Court:

Where have they drained from?

The Witness:

They have drained from their neighbors to the west.

The Court:

Is that recoverable oil?

The Witness:

Yes, sir, it is just as good oil. The gas is not out of solution. It is just as mobile as when the field was in its virgin state.

The Court:

All right, go ahead.

A. Well, take the red, it shows the Gladewater Nose. This B lease is in this position, half of it is in the red

and half is in this light green. This area is structurally high. When all of the area to the north, to the west and to the south, in this manner, is drowned out by water this area will still be above the water level. And they have this tremendous area, it drains into this area in this direction from southwest-northeast. It drains from west to east, and it drains from northwest to southeast into this area, because water is heavier than oil and it will float up, not regularly, but the water table here will be more regular than it will in these places where you have varying conditions of porosity and permeability. The water level here will encroach more uniformly because of the uniform sand.

The Court:

Your idea is they are eventually going to get all their oil?

The Witness:

Yes, sir, I think they will.

345 The Court:

And by this lesser withdrawals you have here the other people will recover more of their oil?

The Witness:

That is right.

The Court:

And that there will be less of it trapped and lost?

The Witness:

I think if the field is produced at a rate of production where you have a decline that has been in effect since June 10, 1933, that you will have an ultimate recovery of something on the order—an ultimate recovery greater than you would under open flow conditions—something of the order of half to a billion barrels.

Q. Will that also be true on the Rowan & Nichols, will they get more under this system than they would under an open flow or unrestricted flow?

A. I think so, even though they have drained to themselves more than—approximately 350,000 barrels of oil to date.

Q. In other words, the amount of oil that is under their lease now is practically the same as it was when they put in their first well?

A. I have some estimates that I can show. Under the varying estimates that Mr. Rowan has given, he first estimated 45,000 barrels per acre; before the Railroad Commission 70,000 barrels per acre; his engineers 60,000 barrels per acre. And he says that he originally had 60,000 and now he has 46,000, and the difference is 14,000, which is the amount he has produced.

Q. Is that oil that is under that lease now, 346 is it recoverable oil?

A. It is recoverable oil. It is oil that has the original gas in solution. It is just as good today as it was in the virgin state of the field. It has the same, practically the same mobility, the same compressibility. We performed experiments ourselves to determine the coefficient of expansibility or compressibility of the East Texas crude, and certainly the reservoir, if no water has encroached under this 24.99 acres, the pore space is the same as it originally was and it has as much oil as it originally had except that which was lost by expansion, which is only one-tenth of one per cent for each hundred pounds pressure drop.

Q. Mr. Cottingham, if you at this time gave Rowan & Nichols, the Rowan & Nichols lease a greater proportion of the withdrawal than they are now getting, in other words disregarded the time element, would they in fact eventually get a whole lot more than their share of oil?

A. If they got from now on out a recovery of oil which was in the ratio of their recoverable reserve they

would get more than, much more than they originally had in place, much more than the original recoverable reserves were.

Q. Now, why is that? Is that because they are going to last much longer?

A. No. Because if they are going to apply a formula to get as much oil as they have under there now—they have drained from their neighbors more than  
347 350,000 barrels of oil, so if you give them the opportunity to recover what is under there now they will get what they have drained into them plus what they originally had.

The Court:

That drainage proposition to them is interesting. I am not sure I understand it. Why have they drained?

The Witness:

The Bureau of Mines made a test on the expansibility of oil and they showed that for each hundred pound pressure drop that the oil expanded about one-tenth of one per cent, or a total of forty-nine-hundredths per cent for each five hundred pounds pressure drop. They have five hundred pounds less pressure today than they originally had, so the water hasn't encroached, it hasn't increased the pore space in their reservoir, there is as much oil in there today as they originally had except that which they have lost by expansion. And our Commission, Dr. Patten and Mr. Langford, checking the Bureau of Mines—

The Court:

Where does that oil come from?

The Witness:

What is that?

The Court:

Where does that come from?

The Witness:

From surrounding properties.

The Court:

Aren't they all drilled up and producing?

The Witness:

Yes, sir.

The Court:

How do they drain into Rowan & Nichols? That is what I can't understand.

The Witness:

What is that?

348 The Court:

I say how do they drain from the surrounding properties if their wells are drilled up and producing too?

The Witness:

The oil is under waterdrive. They take out some and another barrel comes in; they take out another barrel and another barrel comes in.

The Court:

They are getting it from the west?

The Witness:

Yes, sir. They have been taking out about 40,000 barrels a year, and they take out 40,000 barrels and have some more shoved into them.

The Court:

You think they are mistaken in their idea that while it occupies space it is not recoverable?

The Witness:

I just feel as certain as I do of anything in the world. I don't think your pore space has changed, I think you have the same container down there and it is full of oil today but it has less pressure than it originally had, and all the oil that they have lost, I mean all the oil that the container lost, underlying that twenty-four acre tract, is what they have lost by expansion. That coefficient of expansibility is recognized by—it was in the previous case that was first submitted, in the Rowan & Nichols case at Fort Worth, and is recognized. It is determined by a bottom hole pressure sampling bomb.

Q. Do you have that computation, Mr. Cottingham, showing what they would have lost by reason of the drop in pressure? I believe you said it was 49/100ths of one per cent of the original oil in place would have been lost by the drop in pressure?

A. Yes, I have that.

349 Q. About how many barrels, in terms of barrels of oil, would have been lost by that drop in pressure?

A. The three estimates that Mr. Rowan gave, one at Fort Worth in 1933, 45,000 barrels of recoverable oil per acre; the one before the Commission at 70,000 barrels was made in 1938, and the one that was made day before yesterday was for 60,000 barrels per acre, from this 24.99 acre tract. Those estimates vary over the original. The 70,000 is 55.5 per cent greater than his estimate in 1933; his engineer's report made yesterday is 33.3 per cent greater than his original estimate of the recoverable oil under that tract. Now, he has produced, according to our figures, 14,332 barrels per acre from this



lease. The recoverable oil—under the first estimate the total recoverable oil would total 1,124,550 barrels and his production was 358,159. Under the 70,000 barrel estimate the total recoverable oil would total 1,749,300 barrels, and to subtract his amount of production to date would leave him 1,339,000 barrels. Under the 60,000 barrel estimate he would have a remaining recoverable oil of 1,141,000. Now, if the oil originally had an expansibility—I mean if the oil originally in place under the first estimate was 1,124,550 barrels then he has that many barrels under his lease today except what he lost by expansion, and the expansion factor is, for 500 pounds

is 46/100ths per cent, then the amount that he  
 350 has lost by expansion for the first estimate totals—this is based on a fifty per cent recovery factor and Mr. Buck used a seventy-five, and I will have to vary these figures to conform to Mr. Buck's recovery figure, and it will be slightly more, possibly a thousand barrels more, but the loss under the first by expansion is 5,172; and the loss under the second estimate, 70,000 barrels, is 8,047 barrels; and the loss by expansion under the 60,000 barrel estimate is 6,897 barrels. Now, that shows that this tract has drained from other tracts under these various estimates these amounts respectively under the different estimates: 359,987 barrels; 350,112 barrels; 351,262 barrels. Or in rough figures they have drained from other tracts approximately 250,000 barrels.

Q. How many, 350,000?

A. Yes, 350,000.

Q. I believe there is an error in subtraction on that first estimate, isn't there, Mr. Cottingham? It ought to be 353,987.

The Court:

Do you think that all comes from the west?

The Witness:

I think it comes from the west for this reason, you can't have flow in the reservoir—you can have flow-age only from high pressure to low pressure.

The Court:

Well, is there a drainage going from them to the east?

The Witness:

Yes, the same drainage east of them that there is west of them.

351 The Court:

Then how do they stay stationary?

The Witness:

What is that?

The Court:

Do they stay stationary because they are getting as much from the west as they are losing to the east?

The Witness:

That is correct.

Q. Mr. Cottingham, they are not only getting as much from the west as they are losing to the east, but also the sum total of what they are losing to the east and what they are taking up above the ground themselves, isn't that correct? In other words, in the loss, what they are taking out plus what may have been drained from them to others, has it not been supplanted by what has been drained to them from other tracts?

A. That is correct.

Q. Then there has been a net gain over this period of about 350,000 barrels?

A. Of recoverable oil.

Q. Now, where they have been drilled to a greater density than the surrounding tracts, they have created in their particular tract a low pressure area, and for that reason have drained oil to their tract from all directions, have they not?

A. Mr. Hart, the area is so permeable that the low rates of withdrawal doesn't create low pressure areas.

Q. I see. Does it create a differential in pressure at the time of production from those wells?

A. It does. Any withdrawal creates a differential.

Q. Now, Mr. Cottingham, you said that the water would be coming in from the west and north and south and the Rowan & Nichols area would go out of production last. Would that, in fact, emphasize that if the water level instead of rising horizontally like that the water table would rise as Mr. Buck said yesterday, somewhat at that angle as it came up the structure?

A. That is right. We took from our cross section map that was constructed on Schlumberger logs and calculated the top of the Woodbine on that well. Their wells are around minus 3,380, giving them a five or eight foot leeway to work on. If the water encroached on a perfect plain then there would be only about thirteen per cent of cross section that would be out of the water when the water reached them. It would be less than thirteen per cent.

The Court:

You understand, in asking you these questions I am not intimating any views. I am simply trying to ventilate the matter. I would like to get your views. Now, if you could operate that entire field as under one ownership, or for instance say it belonged to the Government, then it might be well to withdraw it the way you are doing it, but what I would like to know is this, do you,

In your ideas, pay any attention at all to the respective positions of the parties as to whether one of them happens to be in a better position or not, has a better piece of acreage? That is a pretty large piece of land we are dealing with there, and if one fellow happened to have a good well and another man a poor one, one man a thick sand and another man thin, one had water and another no water, do you pay any attention to that at all in your ideas as to how you are going to let him get it out? Or are you only taking into consideration the ultimate result, that we will get out for the public all we can out of this kind of a pool? Did I make my question clear?

The Witness:

I think so. You know it is hard to answer that question, but we are faced with the proposition that it is practically on a per well basis.

The Court:

Well, that is what it looks like to me. The percentage that you allow the better, bigger wells is so small as to be practically negligible; and you are up against the same thing you were in the prior cases. You have had a per well basis order before and it has been invalidated before.

The Witness:

We have 251 fields—

The Court:

I mean in the East Texas field.

The Witness:

Yes. There have been some per well allocations in the East Texas field. Now, in answer to your question,

the only thing that will take care of these various tracts on a per well basis is the time element and for one thing—

354 The Court:

You don't think there is any particular right in it, a right to get your property out and own it within a reasonable time? They have to look forward to a period of thirty or forty or fifty years to finally realize, is that the way you approach it?

A. Well, it might mean that. The longer life—the longer life fields will be forty years. I am quite sure that we will have production here, even though it is flooded with water as we have many fields today, the water has risen clear to the top of the sand and it is a matter of pulling out the water and flushing the scum of oil out.

The Court:

Why, in promulgating these orders, why is it you let all the little fellows, anybody that can make as much as twenty barrels—

The Witness:

We have—

The Court:

Understand, I am not arguing, but I want to understand the philosophy of the thing. There may be a very good reason for it.

The Witness:

We have a marginal well statute that sets a limit by depth of ten, twenty, thirty, thirty-five, with which you are familiar. Now, we reach the proposition that in Texas we have about 34,000 wells that will make less than the marginal well allowance. Then we have about 51,000

wells that will make the marginal allowance, and then some 34,000 flowing wells in Texas. Now, when we take all of the—all that those wells will make, those 34,000 and then take the marginal allowance and sub-marginal allowance together it gives us a figure which approximates our entire market demand. Now, 355 that occasioned the shutting down of Saturdays and Sundays.

The Court:

Now, approaching it from a waste standpoint, and that is the reason for this regulation. Take a well, for instance, that could make nineteen or twenty barrels, that would be regarded as rather a poor well over there, wouldn't it?

The Witness:

That is very poor.

The Court:

Now, would there be any waste if you cut that fellow down to five barrels, say?

The Witness:

I wouldn't be competent—

The Court:

I mean would it hurt the structure?

The Witness:

It wouldn't hurt the structure.

The Court:

Would it tend to drown it out?

The Witness:

It might cause premature abandonment of that particular well and cause a loss of ultimate production.



The Court:

Well; is that necessarily true? Wouldn't he be draining it to some other well that would produce it if he didn't produce it?

The Witness:

Generally. It might be that most of the oil—it is owing to the general conditions in the bore of that well. It might practically all be drained into some other well.

The Court:

Then from a waste standpoint there is no reason for giving an arbitrary allowance of twenty barrels, they could be set back in their relative position?

356

The Witness:

But I don't know what that level would be.

The Court:

Well, for instance you take a well that is capable of making twenty-three or twenty-four thousand barrels a day and you give it an allowable of twenty-two or twenty-three barrels a day, a fractional per cent of what it will make. Then right next to him you give a little well that can't make but eighteen or nineteen barrels a day an allowable of eighteen or nineteen, if it can make it, or twenty if it can make it. Now, what I want to know is how do you justify that?

The Witness:

You might justify it from this standpoint; any common yardstick you apply is going to work a hardship against certain operators, but if you give a spread in the East Texas field, permitting a high for the very smallest

well, and then you are going to have to bring up the field outlet to give a spread between the poorer well and the best well in the field, and then there will be a tremendous waste of oil.

The Court:

You can't give it a spread there because this big well is too big, you have to cut it down a whole lot, of course, to stay within your total allowable, but what I was trying to get at was why do you keep them so close together? One well worth almost nothing you let it make twenty barrels a day, and here is one that will produce a huge amount and it can make only twenty barrels, approximately, a day; approximately twenty-two or twenty-three barrels at the most. Now, just without any technicality about it, from first blush it looks wrong.

357 I am sure you have reasons for it. I am sure it is a matter that you have been thinking about a long time. And that is what I want to see is how you justify it?

The Witness:

You have to first, in looking at it from the State's standpoint, see if the field can produce under a certain rate with a minimum amount of waste. That is the overall picture.

The Court:

Yes.

The Witness:

Now, when you set that—

The Court:

I understand the other people don't disagree with that, they agree that ought to be done.

The Witness:

Now, with reference to the allocation between wells or between tracts, that is the problem that we are faced with. The picture is just as it is today. I don't know how to remedy it just exactly.

Q. Mr. Cottingham, by reason of the way this scheme works in practice do the best tracts actually get a greater recovery than the poorer tracts, a greater ultimate recovery?

A. That is right.

Q. Is that true in the case of Rowan & Nichols?

A. That is particularly true with Rowan & Nichols.

Q. And is it generally true throughout the field that the better tracts will get the larger ultimate recovery?

A. I think that is true that the better tracts will get—the better wells will get the most oil.

358 Mr. Tilley:

We object to that as being a pure conclusion of the witness.

The Court:

I have asked him for his opinion and conclusion for two hours. He is an expert.

Mr. Tilley:

He asked him a thing that on its face—

The Court:

A man that has been handling this business for years—and he is trying to do it the best he can—and the only thing we are interested in is are they doing the best they can to avoid confiscation.

Q. Mr. Cottingham, do you have situations in the East Texas field where you would have two wells right

close together, one a very poor well and one say that was among the highest potential in the field? Don't the wells as a general picture grade off from the poorer wells along the edge to the better wells in the Fairway?

A. That is the general condition. There are exceptions to that.

Q. The areas where you have the poor wells will go out of production first, leaving the better areas to produce longer?

A. That is correct.

Q. And not only will the better areas produce longer at the present rate, but as the poorer wells on the outside give out the better wells will have their per well allowable increase, as the poorer go out?

A. The per well allowable will increase. I  
359 think for two reasons. That you will have wells going clear out of the picture on the east and west sides of the field; then you will have wells that will not be able to make their allowable and those wells located along the longitudinal center all can be afforded a greater allowable when that condition obtains.

Q. In other words, in figuring out how long it is going to take them to get their recoverable oil you have to take into consideration there will be an increased allowable to the better wells in the Fairway?

A. Yes, sir.

Q. Now, the west side wells have to get their oil now if they are going to get it, if they are going to get any of their oil in place at all they have to get it now before they are drowned out?

A. If they don't get it now they certainly won't get it.

Q. They won't get it at all?

A. If you produce this field like a waterdrive field, controlled waterdrive where you pump the water down and flushing the oil ahead of the water, if you would

produce along a contour this way until you produce all of the oil and let the water encroach, then when you deplete that contour go on up to the next contour and let the oil flush right up you would have, in my opinion, a greater ultimate recovery.

Q. But that would deprive those persons to the east of their structural advantage, would it not, by reason of that fact, the fact that oil naturally will be pushed up to the west to them?

A. I believe if you had started it earlier that  
360 would give just about everybody his oil under his land if the withdrawals were regulated to a uniform spacing.

Q. If you cut the wells down, these marginal wells down to below a minimum say of fourteen or fifteen barrels per day would that or not, especially on the west side where there is a lot of water produced, would that cause the wells to be abandoned?

A. Fourteen, they are that now.

Q. Yes, sir, if you reduced that marginal amount below that would that or not cause wells to be abandoned, plugged and abandoned?

A. Prematurely?

Q. Yes, sir.

A. That is correct, certain wells. Now, let me qualify that statement.

Q. All right.

A. It might be that a well would be capable by putting a high pressure or casing pump or Reeder pump on and producing high quantities of water, you might get just one-half of one per cent water—of oil and the rest water and still it would be unprofitable to produce that oil.

Q. The people wouldn't operate the wells if they got it so low they couldn't operate and pay the costs of operation, would they?

361 A. No, they don't stay in business if they can't make something out of it.

Q. If you cut them down below that they will lose the chance to get the oil under their tract, wouldn't they?

A. They will lose it.

Q. Furthermore, there will be some oil trapped, not driven out, and will not be ultimately recovered?

A. Under water drive I think most of the oil in a highly permeable area will go on up dip, but if it is not a homogeneous condition some of that oil will be trapped and a few more holes will get a little more oil.

Q. Furthermore, you spoke of these sand lenses, I mean these shale lenses and volcanic ash lenses that extend through the Woodbine sand. In cases where those come down near the western edge will the oil flow to the east or be trapped in those lenses up against the top of the sand?

A. Where you have irregular conditions of the roof of the structure or you have little humps, if the water table rises up there, if there isn't a well to puncture at that place that oil will be irretrievably lost.

Q. In other words, oil in situations like that, along the west side will be lost until you allow the parties on the west side to draw out the oil through wells?

A. There will be some more oil recovered by permitting the wells to get the maximum amount of oil per well under waterdrive conditions.

362 Q. I believe that the estimate is that there have been about 16,000 wells drilled in the East Texas field while this proration system has been in effect, is that correct?

A. I think that is just about the figure.

Q. Many of them on the west side and many of them on the east side where they are pumping, are they not?

A. Yes, that is correct. And a great many wells have been drilled extending the field since that order has been in effect, feeling out the margins of the field.



Q. And if you cut those walls down to such a point that they can't operate the wells they are going to lose the money they put in those wells?

A. That is correct. Now, if you will note about these wells sticking out on this salient here, if these wells hadn't been drilled I don't think that oil would have gone up dip because there is a sand lense that intercepts the roof of the structure and that little area there possibly has a water level all of its own, and it is just a little miniature East Texas, like the entire area has a water level, that little area has a water level of its own, and it took a well or wells to get it.

Q. Taking it as an original proposition, if there had not been a law and regulations which allowed marginal withdrawal to wells along the west side of the field, would those wells have been drilled and that oil recovered at all?

A. Up in a good many sections, this area here and here, we know that, because the water table up there, they are producing oil below the estimated water level.

That clearly indicates that they have a different water level from the main part of the structure, it is just an isolated sand there.

Q. In other words, Mr. Cottingham, is there a justification of a marginal allowance as a means of prevention of waste?

A. I think so.

Q. And taking the marginal allowance into consideration under the present method of proration do you give to tracts that are more advantageously situated the benefit of their advantage on the structure?

A. That is correct.

The Court:

I don't understand your answer. How do you give to them an advantage?

The Witness:

There is, as I previously stated—the field is practically on a per well basis, there is about 7,000 barrels distributed to those wells in the Fairway.

Q. Will the amount of the proratable surplus above the marginal allowance, allowable, increase?

A. It should increase.

The Court:

Didn't the evidence show about sixteen or seventeen thousand barrels?

The Witness:

What is that?

The Court:

Didn't the evidence show about sixteen or seventeen thousand barrels proratable oil?

The Witness:

I think it is around 7,000.

Mr. Moody:

7,000, Your Honor.

The Witness:

I think it is 7,000.

364 Q. Does that take into consideration what the marginal wells are assigned to them that they don't make?

A. Yes, that is the amount that is allocated above the twenty barrels to certain wells.

The Court:

As I understand it, to make it clear in the record, you say that it is practically on a per well basis. If a well

can't make twenty barrels, then whatever it failed to make is allocated to other more fortunate wells that can, is that right?

The Witness:

First the field has been given a top allowable.

The Court:

Yes, I know.

The Witness:

And then the ones that can't make twenty barrels are given that and then the rest of it is assigned to those that can make twenty barrels, and then the remaining portion above twenty barrels is assigned to the better wells in the field.

The Court:

On a potential basis?

The Witness:

On a potential basis.

The Court:

The result of that is some of them make twenty-two or twenty-three or twenty-four barrels, but none of them run out of the twenties? There isn't any well that runs thirty?

The Witness:

No, the highest well in the field is about twenty-five barrels. And we are beginning to get a lot of wells—we have 437 wells that averages eleven barrels—457 barrels—457 wells that can't make twenty and they average about eleven barrels.

The Court:

That deficit is allotted to the better wells on a potential basis?

365 The Witness:

Well, in effect it is, but the submarginal, referring to wells that can't make twenty, are allocated all they will make; then all the other wells are allocated twenty barrels and then the top allowable of the field, the difference between what the submarginal and marginal allowance is is 7,000 barrels, which all three of those totals the field outlet.

Q. And do you say, Mr. Cottingham, that the amount to be prorated among the better wells will or will not increase as time passes?

A. It is my opinion that as time passes that the Fairway will come into the picture and be allocated a larger allowable as the field becomes more and more depleted. The drilling has dropped off considerable. We have figures on that with reference to the field such as drilling wells and exceptions. The permits are less and less.

Q. In other words, there will be fewer wells to divide the oil between, is that right?

A. The loss of production by dead wells and wells incapable of making the allowable will come to a point and offset the new wells and finally the dead wells and those that can't make their allowance will go out of the picture and a greater allowable can be assigned to the better wells.

Q. And in that way they will be given the advantage of their structure and you will be giving an advantage to the better wells?

A. That is correct.

366 Q. Under any system of allocation if you prevent the loss of their property by those persons having marginal wells or submarginal wells—

in other words, if you make a marginal allowance and you keep a top allowable which they conceded to be about right, under any system of allocation would there be much spread in the marginal wells and top wells?

A. No, there would not.

Mr. Tilley:

Now, Your Honor, is the Court going to permit him to testify to the fact that he or his operator should be given so many barrels of oil to recover his investment? Is that the effect of your question, Mr. Hart? If it is we want to object to it because we submit that is not admissible. It is entirely irrelevant and immaterial.

Mr. Hart:

Our position is this Commission has to consider not only your property but all the operators in the field who have drilled in good faith and in reliance on the orders.

The Court:

What do you contend to be the genesis of the right to regulate this at all? Do you predicate it on waste or do you claim also a question of drainage?

Mr. Hart:

We predicate it on waste. We say the top allowable is fixed on that basis, and we also say the marginal allowance is predicated on waste. After that is taken primarily into consideration then the Commission  
367 has to try to formulate some method that will with reasonable fairness allocate that total production among the owners in the field. Our position is that the present method of allocation does that.

Mr. Tilley:

Your Honor, we submit that if the Commission grants three permits for three wells on a one acre tract it may

have the right to do that, but in doing so it does not have the right to do it except for one purpose, if any purpose, and that is to recover the oil which they say otherwise would not be recovered under that tract. Now, if their purpose is, and it is unquestionably, to show that that second and third well have to be paid for out of the additional oil to be recovered from those wells, and naturally to be recovered from other tracts, then we submit to Your Honor that it certainly is not admissible and we object to it.

The Court:

I don't think there is any materiality in that. When we first started out on this regulation business it was sustained purely as a waste measure and it had to have some relationship to waste, otherwise the owner could produce whatever oil or gas there was under his land and take it under the capture doctrine. There have been some slight departures from that in these gas cases. Now, I don't know whether you think the statute here is broad enough to do that or not with regard to oil. Heretofore they have only been sustained regulations in the East Texas field on the theory that they prevented waste. The question as to whether a man is going to recover his capital investment has nothing to do with waste.

Mr. Pollard:

Your Honor, we contend that primarily these orders are promulgated and enforced for the purpose of preventing waste, and then when they have done that we allocate that allowable production in a distribution fashion as equitably as possible, bearing in mind the primary measure of preventing waste. Now, our position is this, that during the period of time that this proration order, the present method of distribution, has been in effect, that for the purpose of preventing waste there have



been something like 15,000 wells drilled. Each of those wells has then become a vested property right in the various owners of those wells. Now, if we cut the allocation of all of those wells down to a point where they would have to cease production as an economic matter, then there is a physical waste angle, there has been actual physical waste caused. And in addition to that there has been a deprivation of property rights invested by those individuals under the proration order which has been in effect for longer than a five year period. So there would be the double-edged effect not only of actually causing physical waste to cut the minimum allowable down, but there would be the other effect of depriving these people of their investments during the period of time Mr. Rowan and others permitted this order to remain in effect, during the time they made their investment.

369 Mr. Moody:

Does the Court say that the Railroad Commission can fix the allowable so as to enable a man to recover his investment in a well he wanted to drill, that he thought he could make money out of, and things turned out that to operate it it would turn out to be a loss?

The Court:

I don't think that has anything to do with it. As I said a moment ago, the very inception of this idea that the State could regulate a man in producing oil or gas lay in the fact that it is one of the natural resources of the State and it could do it to prevent waste to the detriment of the people of the State generally, and if your regulation didn't have any relationship to the prevention of waste then you have no right to interfere with him, he could do what he wanted to with his oil. And it has been upon that theory that most of the East Texas cases

have been tried out. Now, in the gas cases, of which we have had a good many, one of the statutes recently, related to sour gas, has attempted to control the matter from the standpoint not only of preventing waste, but to prevent draining. And in an opinion Judge Hutcheson wrote last summer, I sat on the Court and he delivered the opinion, that statute was sustained. Now, there has been no such statute passed with regard to oil, has there?

Mr. Pollard:

No.

The Court:

You are familiar with what I am talking about?

370 Mr. Pollard:

Yes, sir, that is a correlative right statute.

The Court:

No, the correlative right statute was stricken several times because it didn't comply with the constitutional requirements.

Mr. Pollard:

The Henderson case is the one you had in mind.

The Court:

This last Henderson case, the Panhandle Gas case.

Mr. Pollard:

Yes, sir.

The Court:

And then finally they got into the statute where it related to sour gas the matter of drainage, and that was sustained. Now, I want to know just as a matter of in-

formation as we go along if that order is completely a waste order or does it have the—also have the idea you prevent—

Mr. Pollard:

It is a waste order, Your Honor.

The Court:

Purely waste?

Mr. Pollard:

Yes, sir.

The Court:

All right.

Mr. Hart:

If the Court please, I think it should be pointed out that the statute requires that when the Railroad Commission finds that waste is taking place or is reasonably imminent the Commission shall make such rule as shall prevent waste or tend to correct or lessen waste, and that upon that finding the Railroad Commission shall distribute pro rata or otherwise a portion or allocate the allowable production among the various producers on a reasonable basis. That is the reason

I said after we determined what the total is on a waste basis and then determine what a marginal allowable is on a waste basis, then you have to distribute the rest on a reasonable basis because the statute says that.

The Court:

Well, I suppose the concept that you have the right to limit the top allowable involves the idea that since you have interfered with the rights of the parties to that extent you must reasonably apportion it between.

them, and that is the crux of the matter, whether there has been a reasonable apportionment, what must be considered in arriving at that reasonable apportionment.

(At this time a recess was taken, at the conclusion of which the following proceedings were had:)

Q. Mr. Cottingham, I believe that you were pointing out before the recess certain areas where because of sand conditions unless the wells had been drilled there would be oil which would not be recoverable. Now, would you point out those areas?

A. Around the margin of the field we have areas that are producing below the estimated water level. Of course that oil would not be drained if there were not wells there because those little sand lenses have special water levels of their own, somewhat comparable to the water level of the entire East Texas field structure, and if you didn't have a well there the oil would not be  
372 drained up dip by water drive because it would be trapped and there would be no way of flushing it out to the east.

Q. If those wells had to be abandoned, plugged and abandoned, would that oil be recovered from other wells?

A. It would be irretrievably lost.

Q. Do similar situations exist in other parts of the field?

A. As the water encroaches from west to east you also have sand lenses intercepting the roof of the structure, and if there is not a well there to drain that oil it likewise will be irretrievably lost; it will not be recovered, in other words.

Q. If the marginal allowable is below the amount required to pay back the expenses of drilling the wells then those areas will not be drilled and the oil will be lost, is that correct?

A. A certain portion of the oil will be lost, that portion that will not be flushed up dip, and there will be some that will not be flushed up dip by waterdrive unless those wells are permitted to produce.

Q. Mr. Cottingham, would you state the factors that enter into the productive capacity of a well? Would you state the factors that enter into a consideration of the productive capacity of a well?

A. To produce?

Q. Yes, sir, to produce oil.

A. Permeability, porosity, sand thickness and pressure and possibly position on structure in the East Texas field.

Q. Now, with reference to porosity are there  
373 variations in porosity between different parts of the Woodbine sand and other parts of the Woodbine sand?

A. Great variations in porosity.

Q. Could you tell us the limits of that variation, between what percentages of porosity exist?

A. All of that information, Mr. Hart, is not available to the Commission, a great deal of the history of the East Texas field is not available to the Commission.

Q. Well, from what information you have could you state roughly what that variation is?

A. I have here before me laboratory tests which were submitted by various companies showing the amount of porosity and its range in values and the average values which we calculated from those various laboratory tests.

Q. Is that part of the information that the Commission has at this time?

A. Yes. It covers only twenty wells; and incidently I would say that the information covering these twenty wells takes a great deal of laboratory experimentation to determine even these twenty, but this is available to us with reference to giving us a general idea within the variance between porosity and connate water and the

amount of shale and impervious sand of the twenty wells.

Q. Where were those twenty wells located, in the same general vicinity?

A. Located throughout the field. The Commission doesn't have a laboratory for determining porosity tests. That is a long and laborious task for even one well. If you take and determine the porosity from top to bottom of a core in a hundred foot section it takes quite a number of days to do that, to determine whether or not this section has this amount of porosity and this section has another amount and so on and so on for a hundred feet.

Q. Do you find marked variation in porosity in the same well?

A. In the twenty wells submitted to us we have an average value of porosity from those twenty wells.

Q. Now, my particular question is do you find variations in porosity in the same well?

A. There is a variation according to these samples of 13.9 per cent to 30.6 per cent in porosity. That is, the range of porosity is between 13.9 per cent to 30.6 per cent in the effective portion of the section.

Q. What do you mean the effective portion of the section?

A. That portion which appears to be saturated with oil.

Q. Will there be portions of the Woodbine sand that are neither saturated with oil nor with water?

A. No. A certain portion of it is impervious to oil.

Q. In other words it won't be saturated with either liquid?

A. In other words the Woodbine formation—I mean the reservoir rock as we know it now was one time filled with sea water, and due to the migration of oil and gas, in this case it appears to be oil because it is undersaturated, there is no free gas except in the south end which



possibly is cut off by a fault. This oil migrating up dip by reason of its difference in specific gravity and other factors, displaces water. It doesn't displace all of the water, it displaces only a portion of the water, and that portion of the pore space that is filled with water, that is called connate water, and then there is—the effective porosity, of course, contains some oil displacing the water and filling the pore spaces with oil, so today we find that in the reservoir the pore spaces are filled with oil and water in varying percentages and we find that the porosity, to your question, varies from 13.9 per cent to 30.6 per cent, which includes connate water and oil.

Q. Now, are there variations in permeability even where the porosity is the same?

A. Permeability and porosity, there is no relationship. You might have in a sand, as Mr. Buck explained yesterday, you might have the same condition, you might have an equal porosity, but permeability is a measure of the ease through which fluids flow through a medium and there is no relationship between porosity and permeability. That is, you might have very fine sand which offers a great resistance to the flow of liquids, including gas, through fine sand, but the question is you might have the same porosity in one case as you have in another but you would have a great deal higher order of permeability and the fluids might move through basket balls faster than it would BB shots because it has to go over more space.

Q. Are there variations in the amount of connate water which is to be found in different sections of the field?

A. A variation of connate water, which is the original sea water that is held in these small spaces by capillarity, the variation runs from 9.69 per cent to 28.7 per cent.

Q. Are there also variations in the effectiveness of the sand, that is, the saturated section of the sand?

A. The variation is from zero to less than 120 feet. I don't know how much in the Fairway is effective because you would have to take out the impervious shale, you would have to take out the impervious volcanic ash in order to get the amount of section that was saturated, first.

Q. What are the variations in permeability in the East Texas field?

A. I haven't that before me, but it ranges from practically zero. You take ordinary shale, it doesn't permit fluids to pass through it, so you might say that that is zero and then of course you have a gravel which might have a permeability factor of 300—3,000 millidorsals or more, a great deal more than that.

Q. Now, because of those variations which exist, Mr. Cottingham, is it possible to calculate accurately, without actually making a test by seeing how much the well will produce, is it possible to calculate mathematically what the productive capacity of a well is? Can you calculate the sand thickness and the porosity and

377 permeability and all those other factors that go into it, or would that be so uncertain under the information that you now have that you can't obtain substantial accuracy?

A. The Railroad Commission has so far as I know only these twenty laboratory tests where they have examined the cores minutely. Now, with reference to Schlumberger logs, all the Schlumberger logs is not turned into the Commission. We never have a Schlumberger log turned into the Commission unless it is a special hearing where it is to prove a certain point in a new field or something like that. I recall no time that we have ever had a Schlumberger log turned into the Commission to explain any conditions that exist in the East Texas field until this suit was filed. Then we made an attempt to acquire all the Schlumberger logs that we could, and I think now we have upward of 200, but they

were collected from one source and from an agency that had made an effort to get as many Schlumberger logs as they could to study the variable conditions of the East Texas reservoir, but so far as all we have to go by, from records that are required by law, is the driller's log.

Q. Well, from the information that you have available could you accurately ascertain the productive capacity of a well by just sitting down and calculating mathematically these factors?

A. Well, the only way to calculate productive capacity or the ability of a well to produce is to let it produce.

Q. That is what I am getting at, you can't  
378 sit down and figure it out mathematically. The only way you can find out what the combined action of these different factors is is to let the well produce, isn't that right?

A. You have four or five factors. You have permeability, porosity, sand thickness and the pressure and possibly position on structure. The proximity to water, that enters into the factors as to the ability of that well to produce, and that is the proof of the pudding.

Q. What is?

A. Just let it flow and see how much it will make.

Q. Well, is that what you do when you take potential tests on wells?

A. That is correct.

Q. What factors, then, does a potential test reflect?

A. It reflects porosity, permeability, sand thickness and pressure and in relationship to the water that maintains that pressure and possibly position on structure or its relationship with reference to the water level. I am not particularly clear on that point.

Q. Now, of course, Mr. Cottingham, the potential doesn't indicate the acreage in a lease or anything of that kind, does it?

A. No.

Q. If a man wants to have his lease drilled up as densely as his neighbor he can apply to the Commission for a permit to drill under Rule 37?

A. Yes.

Q. But except for the acreage, then all of those  
379 factors which would go into determining the recoverable reserves are reflected in the potential?

A. Potential is reflected in reserves of the recoverable oil. Before you know whether you have good oil land or bad oil land you first have to have a well. Then the next thing you take into consideration is its ability to produce.

Q. Now, Mr. Cottingham, in trying to find out what potentials should be assigned to the wells in the various areas in the East Texas field what system did the Railroad Commission adopt for the purpose of finding that out?

A. I don't believe I get your question, Mr. Hart.

Q. What method did the Commission use in trying to find out what potential it should assign to the wells in the particular areas of the East Texas field?

A. The map, I don't know what exhibit that is, if you will refer to it.

Q. It has been marked as Exhibit 38.

A. Exhibit 38 shows seventy-one key wells in the East Texas field that was flowed for two hours. The first hour they flowed the wells in order to condition the wells and get them in good flowing condition. Then the oil was measured. The second hour the well was flowed the oil was measured and that represents the potentials of those as reflected on that map, the second hour's potential of the ability of those wells to produce, during the second hour, under uniform conditions. That is, the  
380 restriction was that those wells were to have seven inch casing; that there was to be two flow lines from the casing of four inches in diameter; that there was to be one flow line from the

tubing of four inches in diameter. There was no restriction on the size of the hole below the casing.

Q. In other words, the Commission tried to have the test taken under the same mechanical conditions in the wells?

A. That is correct, so that they would reflect the ability of those wells to produce under those uniform conditions.

Q. Now, after those tests were taken were those wells placed on a map and contour lines drawn on a map similar to the one which is there on the board as Exhibit No. 38?

A. That is correct with this exception, those seventy-one wells were spaced within the productive limits of the field. The heavy dark line on the map represents the approximate limit of production or where the Woodbine sand is at approximately zero in oil saturation. Now, that zero line was determined by some 250 or 300 wells. That line was drawn between dry holes on the outside of the productive limits and producing wells within the productive limits and that line is the result of between 250 and 300 wells. That was the zero line. That, for all practical purposes, was the line where you would expect the production to be nothing or a slight few barrels. Of course we have had to change that line from time to time because as previously pointed out, you encountered production beyond those limits in areas which had not been fully defined  
381 by drilling when the original map was made or by reason of these sand lenses intercepting the roof of the structure, causing production to be beyond the limits of the general reservoir; that is, those little isolated lenses having different water tables from the main reservoir.

Q. In other words, in some cases you got producing wells where there previously had been drilled dry holes?

A. What is that?



Q. In some instances you would get producing wells outside the area where previously dry holes had been drilled?

A. Yes, sir.

Q. After those tests were made, explain briefly how the contour lines were drawn.

A. The contouring of this map after the productive limits of the field was determined, the zero limits of the field was determined, we took those key wells and contoured this map mathematically in geology. Sometime when you are in a particular geological province and you know the force, the particular tonic forces that cause structural folding; you extropulate, but so far as this map is concerned itself, in order to avoid any criticism by any operator, it was contoured mechanically, that is, between zero, the zero line and any well the contour lines were spaced equally with reference to zero and the capacity of that well to produce per hour. The interior wells were contoured the same way. In all of the interior wells the

spacing was accurately measured by an engineer's  
382 rule and the contour lines were spaced according to the ability of one well as to the ability of another well. So you might say that the map was contoured mathematically so that there would be no discussion as to the personal equation entering into the contouring of the map.

Q. After those original tests were made were some additional tests made at the requests of operators for the purpose of checking on the results you obtained?

A. Yes. The first map as adopted by the Commission I believe it was February 1, 1935. Soon after I assumed the capacity that I now occupy. There was sixty-seven wells. The present map reflects seventy-one wells. After the first map was made and adopted by the Commission the Commission invited any operator that felt aggrieved by reason of his potential to have potentials made. In pursu-



ance to that request of the Commission there has been an increase from sixty-seven to seventy-one wells.

Q. Have other tests been made in addition to those you have spoken of on individual wells in order to ascertain their potential?

A. What is that?

Q. Have other wells besides those you have spoken of been made—potentials—on individual wells to check on their potential?

A. Not officially, and I don't know of any. The Commission was already ready and willing to have a potential test made to determine the potential capacity of a particular area.

Q. Now, also on that map there are some other circles drawn. The red circles, I believe, are the potential key wells?

A. The red circles are drawn in diameters of quarters and the red circles I can't—~~the~~ yellow circles I can't see them from here. They are smaller, but they represent the ninety-one key wells which are used monthly in the bottom hole pressure surveys.

Q. From the tests made on those bottom hole pressure key wells do you determine the pressure in the field according to the chart that you previously testified about?

A. That is right, monthly, for this reason, as water encroaches pressure declines due to mass production, and I mean, by mass production I mean volumetric withdrawal with reference to oil, water and gas, and in order to tell something about the decline under a certain rate of production it is better to take those bottom hole pressure surveys once a month and make your adjustments accordingly to reach that point of critical rate of production where you can produce the field with the least possible physical waste.

Q. Now, Mr. Cottingham, would you please step over here. I would like for you to look now at Exhibit 39.

A. Yes, sir.

Q. Mr. Cottingham, is this map, this basic map, substantially the same map which was introduced yesterday when Mr. Buck was testifying, being Mr. Hudnall's map of the sand thickness of the Woodbine section in the East Texas field?

A. I think it is the yellow portion reflects substantially the area covered by the eighty foot isoback line. That is the line of equal thickness of Woodbine. I think that is correct.

Q. Do you know whether these were transposed? Is this a potential map or basic map or sand thickness map?

A. What is that?

Q. Is this basically a potential map or—

A. The map itself is a potential map, the same as Exhibit 38.

Q. I see. Then what does this green line indicate that has been drawn around certain areas on that map?

A. The green line?

Q. I am now speaking of Exhibit 39.

A. The green line on Exhibit 39 represents the 860 foot—not foot, barrels contour of the potential map.

Q. Now, what significance does the 860 barrel contour have?

A. To the eight hundred isoback line?

Q. No, I mean all wells within this 860 barrel contour line, do they have more or less allowable than twenty barrels per day?

A. All wells without—to the north and south and east and west beyond the limits of those enclosures as reflected by the green line gets twenty barrels or less. They get twenty barrels if they can make it and less if they can't.

385

Mr. Tilley:

Outside the green line?

The Witness:

All wells within the green line contours participate in a potential factor. They get twenty barrels or more.

Q. Could you point out to the Court the location of the Rowan & Nichols lease on this map?

A. Right there.

Q. It is within that higher allowable area, is it not?

A. Yes, it is within the high allowable. It is near the east. It is about two-thirds—it is beyond the halfway limit toward the east of the potential, 860 foot potential contour.

Q. Then the yellow area enclosed within the red lines, what area is that?

A. That represents the area in which the sand thickness, according to Mr. Hudnall's map, is eighty feet or more in thickness, I mean the Woodbine. It doesn't necessarily mean the effective part, but it means the Woodbine section from top of the Woodbine to the lower part of the Woodbine. It is eighty feet or more in thickness.

Q. Mr. Cottingham, would you state then from that map whether or not the higher potentials are found generally in the same part of the field as the higher rate of sand thickness area?

A. Generally the higher potentials are where you find the greatest thickness of sand. However, the thickness of sand is only one of the factors of four which enters into the capacity of a well to produce.

Q. Then where these areas do not coincide  
386 what would your explanation be of the fact that they are different?

A. In the north end of the field the conditions of permeability, porosity, sand thickness are about the same and the potentials of the wells are about the same. In the south end of the field when you have four variables, permeability, porosity, sand thickness and pressure, as those factors change the potential of the well changes and they

have changed on the south end for obvious reasons. One is because of the difference in the permeability of the sand.

The Court:

Do you think the field is of such a character that it can all be subject to uniform regulation?

The Witness:

I think so.

The Court:

Despite these variations?

The Witness:

I think it should be.

Q. Along that line, Mr. Cottingham, does the potential method of allocation take into consideration the actual combination, in the way it is worked out in the field, of those various factors?

A. I think the potential is the thing that reflects permeability, porosity, sand thickness and pressure more than any other factor. That is all—and possibly position on structure or its proximity to water.

Q. Now, Mr. Cottingham, if you tried a  
387 formula that was based on sand thickness alone or on pressure alone or on permeability or porosity alone or any of those factors, times acreage, or if you considered any one of those factors would you get as fair a picture of the productive capacity of the wells as you get by using the potential method of allocation?

A. In as much as I have not calculated those others, but have a general picture, and in as much as the variation of all those factors seems to be within ranges from a low to a high as much as potential, it would occur that potential reflects just about as uniform a condition as any con-

dition—as any factor, any set of factors you could use, because it takes into consideration all of them.

Q. Mr. Cottingham, have you prepared a tabulation of the density of drilling of wells in the East Texas field?

A. I have.

Q. Do you have that there?

A. I have it, and I had prepared a chart that showed the relationship of the various break-downs in sizes of half acres, half acre densities according to wells, but in this scuffle I find that I do not find—here it is.

Q. Will you please come look at this and see if this is what you have in mind?

A. May I find my data from which that chart was constructed?

The Court:

Counsel, can't matters of that kind be put in evidence without the necessity of going into all the minutia with regard to them? The extent of the field has been 388 stated here in the record, the number of wells have been stated, the exceptions to Rule 37 have been stated and a very fair picture of the amount of drilling over there. If you take that study up you can devote a long time to it, and I don't think it will get us very far. Isn't it better just to state the ultimate fact and let it go at that? He can talk a half hour and after we get through with it we wouldn't be any further along.

Mr. Hart:

All right, sir.

Q. Mr. Cottingham, then just summarize what information you have there. Do you find that most of the wells in the East Texas area are drilled on a smaller area than five acres or on a larger area than five acres?

A. I haven't that tabulation. Have you got it there? I would have to refer to my chart to determine that be-

cause I haven't the cumulative before me. I say, Mr. Hart, I haven't the cumulative before me. I would have to refer to my chart.

Q. Isn't that the cumulative there?

A. No, the cumulative hasn't been given me.

Q. Is it on that one?

A. Yes, sir, it is on this one.

Q. Let me revise my question, please. It having been shown that Rowan & Nichols, with their sixth well, or permit for a sixth well, have a density of one well to 4.16 acres, I will ask you what percentage of the field is drilled up to that density and what percentage of the field is drilled up to a lesser density than that?

389 Mr. Tilley:

We object to that, Your Honor, unless it is based upon a hypothetical question, because the evidence shows that permit never has been granted us because the Railroad Commission granted the motion for rehearing.

The Court:

You don't dispute you have five wells?

Mr. Tilley:

That is right.

The Court:

And you have another in a period of incubation?

Mr. Tilley:

Yes, sir.

The Court:

Let's not speculate with anything like that.

Q. Take it at 4.16 and then at five acres, if you could give the number of wells rather than percentages.

A. The cumulative number of wells, there are—I don't have it in just that break-down.



Q. Well, give it to us as best you can.

A. I have it in four and a half, the density bracket from four to four and a half acres.

Q. All right, how many wells—

A. At four acres there are 9,338 wells. That is on a density of four acres or less.

Q. Then that would make—

A. There is 11,465 wells, which is on a density of four and a half acres or less; and that falls between those brackets. They might be interpolated from that chart.

Q. Now, if there are nine thousand some odd, 390 the number you read, that are drilled to that density or a greater density, then how many are drilled to a less density?

A. Those figures that I read were less density or greater?

Q. Greater density or less acreage.

A. There are 9,338 wells that are drilled to a less density than—

Q. I think we are getting mixed up here. That are drilled on smaller tracts than four acres?

A. That is right.

Q. That would be more densely drilled?

A. That is right, I am corrected; I stand corrected.

Q. All right, then the remainder of the 25,900 wells are drilled on larger tracts?

A. That is correct.

#### Cross Examination.

Questions by Mr. Tilley:

Q. Mr. Cottingham, what is the present spacing under Rule 37 in the East Texas field?

A. What is the present?

Q. What is the present spacing? The equivalent of one well to ten acres, isn't it?

Mr. Pollard:

We object to that as a legal conclusion unless he means the density to which the field has been drilled.

391 The Court:

Rule 37 would speak for itself, of course, but I suppose there is no objection to his stating it.

Q. What is it, Mr. Cottingham?

A. The spacing rule in the East Texas field?

Q. Yes.

A. Twenty-one barrels to one acre.

Q. Now, will one well reasonably drain ten acres in the East Texas field?

A. In certain areas I think one well will drain more than ten acres and in certain areas I think one well will not drain ten acres.

Q. All right, generally throughout the field what would your opinion be?

A. Throughout the field?

Q. Yes.

A. If you owned all of the acreage in the East Texas field?

Q. No, just give me a general idea of how much of the East Texas field one well to ten acres would not reasonably drain.

A. I think in the area of Rowan & Nichols one well will drain considerably more than ten acres. In the south end of the field I think it will drain a great deal less than ten acres.

Q. Mr. Cottingham, we will save a lot of time, I think we can get through with you in about fifteen minutes, if you will just answer my questions.

A. All right.

Q. Tell me what percentage, generally, of the East Texas field do you think cannot reasonably be  
392 drained by one well to ten acres and what number of acres, approximately, if you know.

Mr. Hart:

If the Court please, I wish to object to that question as being irrelevant and immaterial for the reason I think we have to consider the field as it now is drilled rather than on the hypothetical situation which Mr. Tilley is supposing.

The Court:

What is the materiality of the question?

Mr. Tilley:

I am trying to show by cross examination that one well will reasonably drain a certain area. They say the more wells the more oil. I am trying to show that one well will reasonably drain a certain area.

Mr. Pollard:

Your Honor, the position there is they are then in effect collaterally attacking a rule of the Commission and its findings therewith, where they have made no direct attack on it in this suit at all.

Mr. Tilley:

We admit it.

Mr. Pollard:

And the Supreme Court has already held that the exceptions to the rule providing for exceptions to less distances to prevent confiscation and prevent waste are equally a part of the rule as the so-called ten acre spacing which says the man can drill at those distances without permission from any one.

The Court:

Overrule the objection.

393 A. What is the question?

Q. I say what percentage or what approximate number of acres in the East Texas field are there that you say one well to ten acres will not reasonably drain?

A. I haven't made an analysis of that portion of the field which I feel that one acre—more than ten acres would drain, and I have not made an analysis of that portion of the field that I feel that ten acres will not be an adequate drainage area. From a practical standpoint, now, in order that we are talking about the same thing, what do you mean adequately drained?

Q. I mean reasonably drained. You have answered that question before on the witness stand. Can you testify now?

A. What do you mean reasonably drained?

Q. That is to get that amount of oil from under a tract that a reasonably prudent operator would expect to get from under that tract. If you can't answer the question I will withdraw it, Mr. Cottingham.

A. I wish you would withdraw it.

Q. Now, give me the factors again and the percentage of accuracy, as near as you can, that the potential will show in the East Texas field under the way you take those now.

A. The potential in my opinion reflects first the ability of the well to produce, and in that ability of the well to produce it takes into consideration four or possibly five factors.

394 Q. All right, tell me those factors, with the percentage of accuracy, as near as you can.

A. You can't do that.

Q. You can't do that?

A. You can't do it because you have four or possibly five variables.

Q. All right, you will take pressure, it manifests or reflects pressure?

A. Yes.

Q. You can determine that also by bottom hole pressure tests, can't you?

A. That is pressure?

Q. I say you can take bottom hole pressure tests and determine the same thing with more accuracy?

A. That is pressure. You can determine that within a pound or two.

Q. Mr. Cottingham, I say you can take bottom hole pressure tests and determine with a greater degree of accuracy the bottom hole pressure or pressure of a well than the potential will reflect it the way you take it over there?

A. No, potential, that is the proof of the pudding. We might make an error of two pounds in a reading of bottom hole pressure, but potential doesn't make that error.

Q. All right, I will ask you this question, Mr. Cottingham, you take the potential of the Wood well which has a penetration into the sand of two feet. You take the same kind of potential of the Rowan well next to it which has a penetration of sixty feet. Which would show the greatest potential?

395 A. The Rowan.

Q. The greatest potential?

A. Yes.

Q. Then potential doesn't take into consideration the penetration of the sand, does it?

A. What?

Q. The potential of a well doesn't take into consideration the penetration of the sand?

A. But may—

Q. Just answer my question, if you can.

A. Sand thickness is one of the factors in potential.

Q. Mr. Cottingham, I didn't ask you that.

A. All right, I beg your pardon.

Q. I don't want to argue with you, I just want you to tell me.

A. I want to answer you correctly.

Q. Now, if you take those two tests they would be entirely different from a potential standpoint from the number of barrels you would recover, if one well penetrated the sand two feet and the other forty or fifty?

A. They would be different.

Q. That is right.

A. May I make this observation? If you will drill the Wood well as deep as you did the Rowan well, and being in that particular area, and if the other factors were equal, all the factors were equal, then the potential of the Wood well would be the same as the Rowan.

396 Q. That is right, and show the same permeability and same porosity and such factors as that, would they not?

A. There are four factors there.

Q. Let me ask you this question: Would the Wood potential give you any indication of the amount of oil underneath that lease?

A. If it was taken at its present status? We have to go back to how these various potential wells were drilled and how they were equipped before I could answer your question. Under the present condition the Wood well would not because sand thickness is one of the factors that enter into the capacity of the well to produce.

Q. Let's save a little time, Mr. Cottingham—

A. Now these wells here, your company or any other company that took potentials here didn't overlook the fact to take the maximum amount of sand thickness, and they didn't take into consideration—they didn't overlook the fact as to how to put the wells to flow into the tank. they didn't set them on a high hill. The only regulations—

Mr. Tilley:

If the Court please, I want to save a little time.



The Witness:

All right.

Q. Tell me whether or not the Wood well would reflect the amount of recoverable oil under that particular lease if the wells were equipped just the same and penetrated the same number of feet of sand. You can answer that yes or no.

A. I will say yes.

397 Q. You say it will show the result?

A. It will reflect—you first have to have a well and then the size of the well, all of those elements enter into figuring the amount of reserves.

Q. All right, you tell the Court then that that test will show that?

A. The Wood well?

Q. Yes.

A. If you open it up it will be on an order of some eight or ten thousand barrels a day.

Q. Now, tell me if you would take your potential on the Wood well the same way you took Mr. Rowan's potential would that potential of Wood's indicate a different amount of reserves from Rowan or would it indicate—I will state it this way: Would it indicate the recoverable oil under Wood's tract of one-tenth of an acre?

Mr. Hart:

If the Court please—

A. Well, I think so. It is one of the elements, one of the elements.

Mr. Hart:

My objection to that is that the attorney does not state whether he intends to ask what the potential will reflect, the acreage or what he means by recoverable reserves.

The Court:

If the witness thinks the question is ambiguous he can ask him. He seems to be willing to attempt to answer it.

398 Q. Is the question clear?

A. Let me have the question.

Q. If you were to take now a three hour potential under the present plan and under the way you took those potentials shown on that Exhibit 33 or whatever it is, would that potential reflect the amount of oil under Wood's tract?

A. It wouldn't to the degree that those do because those wells were practically drilled through the sand and they reflect all of the four elements and Wood's well scratched it on the surface to keep away possibly from encroachment of water under regulated conditions. And it would not produce as much as the Rowan well even though it was as good a well as the Rowan well is. If it was drilled down to the deep depth of the Rowan well that would be different.

Q. You mean to tell this Court, then, if at this time or at that time when that map was made and those potentials taken that if those wells were equipped exactly alike and if they had the same conditions, the same factors, sand thickness, permeability, porosity, water table, if there was any water under there, would those two wells reflect practically the same potential and would either one of them reflect the amount of oil under each particular lease?

A. It would be one of the factors.

Q. Mr. Cottingham, I believe you stated, or I will ask you to state whether or not the Wood well does have the same potential as the Rowan well on which you  
399 took the potential, is that right?

A. In as much as the Rowan well is less than fifty feet from the Rowan property.

Q. Yes.

A. And in as much as we know that the area has uniform condition of sand thickness, permeability, porosity and pressure, if you drilled the wells to the same depth in the sand, I would say that both of the wells would produce approximately the same.

Q. Now, if you were going to allocate allowables to those wells on the basis of the potential and the potential does show the recoverable oil, then you have given no consideration as between Rowan's well on five acres and Mr. Wood's well on one-tenth of an acre or one acre, whatever you call it?

A. If you allocate the production on potentials?

Q. Yes, and potential reflects reserves, then you haven't given any consideration, have you?

A. The potential of the Wood well is extropolated.

Q. What does extropolated mean?

A. I believe—I haven't looked at my dictionary in a long time, but I believe it means to insert between. It means to supply with equal weight.

Q. Anyway, you haven't given it any differential at all in your proration schedule, you have given the Wood and Rowan wells the same?

A. No I haven't. I am assuming now Mr. Wood might not have drilled his well for a potential test well.

Q. All right.

A. Now, if he had drilled his well I am confident that there wouldn't be very many barrels difference from his well and Rowan's well, drilled to the same depth, because as brought out by Mr. Buck, the area is very permeable, very uniform in that particular area and because it is so close we wouldn't expect any material difference between permeability, porosity, pressure and position on structure and all of those elements.

Q. Now, you have compared this map, this sand thickness map which is Exhibit No. 35. Have you compared

that sand contour map with your potential map, which is Exhibit No. 38, to see whether or not they bear any relation to each other?

A. Is this Exhibit No. 38?

Q. Yes, that is your potential map.

A. Yes.

Q. You have. Do they bear any reasonable relationship?

A. This map here reflects the top of the structure and in this particular area, and I don't know what relationship you want me to determine between this map and that, whether it is sand thickness, pressure, potentials or what.

Q. Does your potential, take the Castleberry Survey, which is in the red on Exhibit 35—that is your sand thickness map, is it not?

A. That is not a sand thickness map.

401 Q. What kind of map is this, then?

A. That is a subsurface structural map on top of the Woodbine, it shows the condition of the top of the Woodbine.

Q. Have you had occasion to look at more than one sand contour map since you have been in the Railroad Commission office? Have you had occasion to look at numerous sand contour maps prepared by major companies?

A. Yes, I have one. I have one—you mean the surface—subsurface contour map delineating the top of the Woodbine sand?

Q. That is right.

A. Yes, I have.

Q. Have you examined several of those maps?

A. Yes, sir.

Q. Then the major companies do prepare such maps?

A. Yes, sir.

Q. They do base their estimates of recoverable oil on those maps?

A. No, sir.

Q. What do they draw those maps for?

A. That shows the top—

Q. Answer my question.

A. What do major companies prepare that map for?

Q. Yes.

A. It delineates the structural position of the various wells on top of the Woodbine,

Q. Mr. Cottingham; answer my question, please.

402 Mr. Hart:

We object to the question as being immaterial. It is immaterial what the purpose or motive of major companies may be in preparing maps.

The Court:

I thought the witness was attempting to answer it. He was giving his idea of what the map was for.

The Witness:

The map is for the purpose of showing the top of the Woodbine.

The Court:

Then he will want to know next why do they want to know that.

The Witness:

That is material if they want to calculate the number of feet to the water level, for one thing.

The Court:

Then in the last analysis it has some relation to sand thickness, doesn't it?

The Witness:

That is correct, if they want to use it for that purpose.

Q. All right, then, they do use that for that purpose?

A. Yes, sir.

Q. Now, do those maps show the water table on the west?

A. Which map?

Q. Sand contour maps of major companies?

A. No.

Q. But they do show the sand thickness in the East Texas field?

A. Are you talking about structural maps or isoback?

Q. I don't know. I will ask you which one have you looked at?

A. This is a map that just delineates how the surface of the Woodbine looks if you could rip off all of the sediments down to the Woodbine and toss it away.

Q. Now, what do the maps of the major companies now show in reference to contour lines reflecting the sand thickness from the east through the Fairway over to the west side?

A. Well, they might show that by cross section maps, as Mr. Buck and I have shown here.

Q. They might show that. Don't you know what they have shown?

A. Well, of course they could show that. I don't know what major companies or anybody else shows. But if you take a cross section from the top of the Woodbine to the base of the Woodbine and if you would take it at right angles to the longitudinal center of the business it would be cross section.

Q. Now, Mr. Cottingham, you have examined Mr. Hudnall's map, haven't you, showing the contour lines there, how the sand thickness varies from the east side on over to the west side, have you not? You have seen that map he prepared; have you not?

A. Yes.



Q. You have seen Mr. Buck's map over here, have you, not?

A. Yes, sir.

Q. Now, have you looked at Mr. Buck's map?

A. I have taken a casual glance at it. I haven't had the opportunity to study it.

Q. Have you ever made any endeavor to prepare a sand thickness map for the Railroad Commission yourself since you have been there?

A. I have not.

404 Q. Have they ever directed you to do that?

A. I have not.

Q. Then if you could prepare a sand contour map showing the sand thickness, if it were possible to do that, you have not made any effort to go out and get Schlumberger tests or logs or such other information as might indicate that, have you?

A. Schlumberger log is a private project. The Railroad Commission of Texas can't go and inquire into personal, private business like that. All they require is a driller's log.

Q. Mr. Cottingham, don't you know that the Railroad Commission statutes, the statutes of the State of Texas give you a right and you have exercised that right to go into the company's office and examine their records? Is that right or not?

A. It is not right.

Q. It is not right?

A. In other words, there are various types of exploratory work, and that is not contemplated, as I understand it as an engineer, knowing nothing about law.

Q. Have you made—

A. Let me answer.

Q. All right.

405 A. That the Commission can't require them to give. They do require a driller's log of every well completed in Texas.

Q. Does that indicate—

A. But they can't require the Schlumberger log. They require Halliburton, who has a similar service, to give us these logs. We don't have this stuff available to us.

The Court:

Gentlemen, you are getting into a lot of arguments about immaterial matters. You ask him a question and he takes the question to pieces and then you argue out each piece of it. You have lost sight of where you are going. What is your point? What is it you want to find out, whether they have taken into consideration sand thickness or if they know what the sand thickness is themselves?

Mr. Tilley:

Yes.

The Court:

You are on cross examination. Why don't you ask him the question direct?

Mr. Tilley:

He won't answer it direct.

The Witness:

Try.

Q. Mr. Cottingham, have you tried to get Schlumberger tests from the major oil companies or from the Schlumberger people so as to permit you to draw a map showing sand conditions over there? Answer the question yes or no.

A. I have not.

Q. You have not?

A. Let me qualify it. If you will permit me, let me qualify that statement. So far as I know the statute doesn't require us to—

406 The Court:

I don't care about that. That is your opinion as to the law. I understood you to testify before lunch you had three or four hundred Schlumberger logs.

The Witness:

We have acquired them since this case.

Q. Mr. Cottingham, you have about 25,000 logs in your possession, do you not, which show sand conditions throughout the field?

A. There are a few of them—

Q. Answer the question.

A. That is correct. We should have a log from every well that is drilled.

Q. But you drew this map from seventy-one wells, did you not?

A. No.

Q. All right, how many potentials did you take over there?

A. We took seventy-one interior potentials and then for locating the zero line between. I should say—I have forgotten how many. I counted them at one time. But between 250 and 300 outlining the zero line between dry holes and productive areas.

Q. All right. Now, let's just start from the north end of the field and go to the south. You say the sand conditions are fairly uniform throughout the north end?

A. I think it is uniform so far as the Gladewater Nose is concerned; on the north end of the structure and around the periphery of the structure so far as we know it to go it is very irregular.

Q. All right. Now, what about the south end?

407 A. It is—what do you mean?

Q. What about sand conditions there?

A. It is very erratic, as reflected in the pressures.

Q. It is very erratic?

A. Yes, sir.

Q. All right. Then you state that the potential does show sand conditions, do you not?

A. It reflects a combination of four factors.

Q. It reflects now what with reference to sand, the permeability, porosity and what else?

A. The thickness and pressure.

Q. All right.

A. And possibly position on structure, proximity to water.

Q. Now, you say that bottom hole pressure does reflect the thickness of the sand?

A. Bottom hole pressure?

Q. I mean potential reflects thickness of the sand?

A. That is one of the elements, one of the factors in potential.

Q. Does it reflect sand thickness within a reasonable degree?

A. That is right.

Q. All right I will give you a sand thickness of—well, I will give you a potential of 400 barrels, a well that will make 400 barrels. Now you tell me where you—you tell me how thick that sand would be.

A. You can't do it.

Q. All right.

408 A. Because you have four factors. You don't know the relationship of those factors.

Q. Then it doesn't show sand thickness, does it?

A. Yes, it shows sand thickness if you have—if you have the same pressure and if you have the same porosity and twice the same thickness you have approximately twice the potential.

Q. Mr. Cottingham, you are not answering my questions, you are not answering my questions. You are telling me that potential reflects a certain thing and then when I ask you how it reflects it then you tell me about

a bunch of other factors. That is not what I want to know. I want you to tell me how you can go to this map when I tell you a well has a potential of 400 barrels an hour, I want you to tell me how you could go to that map and tell me how thick the sand would be around that well.

A. I can't do it.

Q. You can't do it?

A. No.

Q. All right. Now—

A. Because I have three other variables in there.

Q. You tell me also that your potential will reflect the water table, is that right?

A. We—yes, possibly.

Q. That is right.

A. I said possibly. I am not sure on that point.

409 The Court:

What is the ultimate thing you are trying to get at, counsel? Do you want to know whether the potentials of the wells will indicate the reserves?

Mr. Tilley:

Your Honor, I want to show that the potential does not reflect that, and it would—

The Court:

Why don't you ask him would the fact you have a well on a piece of land which produces 500 barrels an hour or 900 barrels an hour, would that indicate how much oil you have in the reserve there or do you have to determine the reserve by other ways? I know you can't get it absolutely, but people buy on engineers' figures and lend money and generally deal on that basis.

Mr. Tilley:

Your Honor, I asked him—

The Court:

I don't want to get in an argument with you, too. I want to get this thing along because after all I want to get something out of it.

Q. Now, Mr. Cottingham, if you were employed to estimate the recoverable oil under a particular tract in the East Texas field would you determine the value of the recoverable oil of that tract by the potential factor alone?

A. No.

Q. You would not?

A. No, sir.

Q. All right, how would you go about determining the recoverable oil?

A. Under a particular tract?

Q. Yes.

A. I would first determine whether it had a well on it.

410

Q. That is right.

A. Then I would see how big the well was, knowing that a well's potential takes into consideration the factors of permeability, porosity, sand thickness and pressure.

Q. Let me correct the question. Let me change the question. If you were going to estimate the recoverable oil under a tract in the East Texas field and you had this potential map before you could you estimate within any reasonable degree of accuracy the recoverable oil under that tract?

A. I would take the potential map as one of the factors.

Q. That is not my question, Mr. Cottingham.

A. Let me see. I beg your pardon if I misunderstood your question.

Q. I asked you could you take this potential map in front of you, looking at these potential contours, these potential contour lines alone, and tell within a reasonable degree of accuracy the recoverable oil under that tract?

A. No, sir.



Q. You could not?

A. The answer is no.

Q. All right; we are getting somewhere. Now, Mr. Cottingham, let's suppose this is the east side, I am pointing up above the map. This is the east side on Exhibit 38. Suppose all of this area, about one-third of the field across was drilled to a density of one well to one acre and all of the east side was drilled to a density of one well to one acre—

411

A. The west side you mean?

Q. Yes.

A. All right.

Q. But the Fairway was drilled one well to ten acres. Would the Fairway or those owners of leases in the Fairway get, under your present plan of proration, the amount of oil which at this time underlays those leases?

A. Let's see, this is the west side, which is drilled to a density of what?

Q. Everything is drilled to a density of one well to one acre except the Fairway.

A. It is drilled to what density?

Q. One well to ten acres. Would the leases or the operators of those leases get, under your present plan of proration, the allowable—the reserves under those tracts, the recoverable reserves?

A. I think not.

Q. You think not?

A. (No answer.)

Q. Doesn't that show, Mr. Cottingham, that it doesn't matter how many wells you have in the East Texas field or what your average density is, if you have one well to ten acres, the measure of whether or not any operator in that field will recover ultimately the oil under his land depends solely on the amount of his daily allowable?

A. The amount that he recovers will always depend on the amount he takes out.

412 Q. All right; then the fact that the field may be drilled to a density of one well to five acres or one well to six acres doesn't mean anything in so far as the amount of recoverable oil that any operator may get, unless the particular operator is permitted to produce or permitted to drill enough wells that he will ultimately get the oil under his tract?

A. I think it is obvious that if you have more wells and more allowable you will get more withdrawals from that particular tract.

Q. All right. Now, Mr. Cottingham, let's say that we have three containers. Two of those containers have a gallon of water and one has five gallons of water. And we will place them in a line east and west.

A. Let's see, I didn't get the size of those containers.

Q. Each one is one gallon except the middle and it is five gallons. Now, the two one gallon containers on the east and west of that five gallon container, if you put—and those containers are disconnected—if you put one tube in each of those three containers and you withdraw ratably and equally from each container it will take five times longer to get the water out of the five gallon container than it will to get it out of the one, will it not?

A. According to mathematics you are correct.

Q. All right, let's say that the East Texas acreage around Mr. Rowan's area, around the Gladewater area—

A. Here it is up here, Mr. Tilley.

413 Q. Well, this area, this Gladewater area.

A. Here it is.

Q. Let's say that the east side and the west side both have an ultimate recovery of 10,000 barrels to the acre and the Fairway has 100,000 barrels to the acre.

A. That is just a theoretical assumption?

Q. Yes. Now, if you produce the wells on those three sections equally at twenty barrels a day or comparatively twenty barrels a day, I want you to tell me how the time element will take care of Mr. Rowan and his company so

he will ultimately get the amount of oil under his tract?

A. According to the conditions obtaining in the East Texas field at the present time?

Q. Yes.

A. According to its present plan?

Q. That is right.

A. For the last six years, I believe it is six, six or seven years that Mr. Rowan has been producing on his tract he has produced approximately 358,000 barrels of oil, or 14,332 barrels per acre. I am showing where the time element will come in.

Q. That is all right.

A. He has taken out more than a third of his oil according to his first estimate and a considerable portion according to his second estimate and a considerable portion of what his engineer says he had originally under his land. Now, he has today as much oil as he had  
414 originally, less, according to the estimates, between six and eight thousand barrels, so he hasn't been hurt yet by drainage. In fact, he has drained to him 350,000 barrels. Now, the question is how is he going to fare from now on out?

Q. That is right.

A. As previously pointed out, in my opinion the highest portion of the area is in the south end. It is some forty feet higher than it is up here, but because of the variable condition of the reservoir rock, impermeable nature of the rock, the water force can't transmit itself, its pressure, across this much distance across the south end. Therefore, this area in here is practically operated on a gas drive proposition and there wasn't very much gas in the oil in the reservoir in the first place. In other words, it was saturated only at 750 pounds per square inch, whereas the pressure was 1,625 pounds per square inch. So this area here is going out of the picture first, as evinced by the area now has a gas cap in it. The upper portion of the roof of the structure is filled with gas. The

gas has come out of solution. The wells are on the pump, and your greatest number of wells that won't make the allowable are in this portion of the area here where it is the highest. It is my opinion that this highest area here, because of the impermeable condition of the structure, will go out of the picture first. Now, as we come on up through the red contours we are coming to an area on the

415 Gladewater Nose which is very permeable, and it is a nose, it is in that condition, that is, it is a hump. Now, this area here in which the Rowan & Nichols well is located will receive drainage, as it has heretofore in the amount of 350,000 barrels. It will receive drainage from the northwest it will receive drainage from the southwest. In other words, it is a focal point, there will be a radial drainage into a small portion of the Woodbine section, as evinced more particularly by this line here. Those are lines of equal distance, equal distance above sea level, and of course the water level will rise somewhat regularly, even though you have variations, high variations locally. So when the water encroaches and all of this portion is flooded, this portion is flooded and this portion is flooded to the southwest, this area in my judgment will be the last area in the East Texas field to produce. He will, as he has done in the previous, receive oil from the northwest. He will receive oil from the west. He will receive oil from the southwest, and his position possibly five years from now will not be materially different from what it is today with the amount of his recoverable reserves under his tract.

Q. All right. Now, Mr. Cottingham, you are basing the present order not on how much oil was underneath a tract five or six years ago, but on the amount of recoverable oil at the present time, are you not?

A. Let's take it that way.

416 Q. You don't take into consideration the hot oil run around the East Texas field?

A. That is right.

Q. Now, you talked about Mr. Rowan estimating some time ago that he had more oil than he estimates now?

A. Yes, sir.

Q. Of course you know, do you not, Mr. Cottingham, that the best engineers in Texas underestimated the recoverable of the East Texas field?

A. That is just it.

Q. That is just it. Now, let me ask you this: do you not know further that at the time those estimates were made that the allowable at that time was approximately a million barrels a day?

A. Yes.

Q. Did you not make the same estimate?

A. No.

Q. Would you today make any estimate as to reduction and ultimate recovery if the allowable was a million barrels a day?

A. I am telling you I feel—

Q. Answer my question.

A. What is that?

Q. Can you answer my question? If the allowable was a million barrels today a day would the ultimate recovery of the field be reduced substantially?

A. I would think that the recoverable oil of the  
417 East Texas field at a million barrels a day would be reduced on the order of somewhere near a half and a billion barrels if it was raised to a million barrels a day.

Q. Mr. Cottingham, you heard the figures and testimony given by Mr. Rowan to the effect that although the rest of the field has recovered so far to date thirty-seven per cent of the estimated recoverable oil his lease has only recovered twenty-seven per cent. So Mr. Rowan, if that testimony is true, has not recovered any more than his fair share of the oil, has he?

A. Possibly not as much, possibly not as much, but in time he will recover possibly more.

Q. That is what we are getting to. All right, here the Rowan lease is in the Fairway. Mr. Cottingham, it doesn't make any difference, does it, how much oil is underneath a lease until the operator is permitted to recover it, that is academic, isn't it?

A. I don't know whether it is academic or not.

Q. In other words, if you say a man has 50,000 barrels per acre recovery, it is just merely fiction if the allowable is not such he can recover that, is that not right?

A. Well, you know—

Q. You can answer that question yes or no.

A. I would rather not answer it just yes. I will say yes with some provision.

Q. Now, Mr. Cottingham, let's come back to 418 the Rowan lease, the allowable. He is on the top of the structure, is he not?

A. That is right, he is on the Gladewater Nose, near the top.

Q. Near the top of the structure?

A. Yes.

Q. Now, you are going to give consideration to position on the structure, are you not? You said you were going to give consideration to position on the structure. You said you thought that was a factor to be considered?

A. You asked me about this potential and I said it might reflect position on the structure. I haven't come to that yet.

Q. I will ask you whether or not in allocating allowable among operators you would give consideration to position?

A. To the operators generally or Mr. Rowan?

Q. To operators generally and to Mr. Rowan too?

A. The present method of allocation takes into consideration position on structure.

Q. You give consideration to sand thickness. He has practically the thickest sand in the field, does he not?

A. It is near the thickest.



Q. And you say the sand condition playing across the field there is generally uniform and very permeable and with good porosity?

A. The most uniform condition in the entire field is in this area.

Q. All right, then how does the waterdrive move in reference to the approach of the same to his lease and which direction will it move the oil unless it is extracted?

A. Here is water, if it encroaches somewhat uniformly. It might be up and down and up and down and up and down.

Q. Give the directions for the Court reporter.

A. But his high—

Q. Give the directions.

A. His highest position, this defines the contour lines between 3,220 and 3,200—

Q. You misunderstood my question, Mr. Cottingham. I just want you to point out on Exhibit 35 here which way the water is moving and approaching which way. Is the water moving here?

A. It is going to gradually move in an irregular eastward position, but it can't ignore the structural position of the Gladewater Nose.

Q. All right. Now, is the water table going to rise evenly or is it going to go in contours or is it going to go—how is it going to go?

A. I refer to this exhibit in answer to your question. I will refer to this exhibit here, Exhibit No. 34.

(At this point a recess was taken, at the conclusion of which the following proceedings were had:)

Q. Now, Mr. Cottingham, let's resume over here, and I think I can get through with you in just a minute. Did you state just exactly how the water was going to approach over here, whether it was going to be level or just how it was going to be, or is it going to be as you have indicated on Exhibit 34?

A. In this particular area?

Q. The Rowan area.

A. In the Gladewater Nose, if you would permit me to state, that is evinced by this structural contour here. It appears from all the evidence that we have that the conditions of permeability and porosity are more uniform there than any other place in the Woodbine structure of the East Texas field, much more so than it is in the south end.

Q. Yes.

A. Now, if the conditions of permeability are uniform and the porosity is uniform and the withdrawals are uniform then the water level will have a tendency to rise, but we have this condition—

Q. That answers my question.

A. I haven't answered your question.

Q. Just answer, don't tell me why, just tell me whether it does rise on a level or whether or not it is kind of a sawtooth shape like you have on Exhibit 34?

A. I think the water table will be sawtoothed like that.

Q. Like that?

A. Yes, sir, that is right because you don't have any ideal conditions in reservoir rock.

Q. All right, if the area east of Mr. Rowan is very densely drilled and the area around Mr. Rowan's  
421 lease is not very densely drilled, then the oil will migrate, of course, to the east. Is that right?

A. Now, let's see.

Q. All right, just say this area all through the east here.

A. Through this part?

Q. The east part of the Castleberry, east of the Castleberry, and the area in the Castleberry is not densely drilled, under your present plan of proration the oil will migrate to the east side, is that right?

A. I am afraid I don't understand your question. Do you mean to take a hypothetical case?

Q. A hypothetical case.

A. All right.

Q. There are very heavy withdrawals from the east due to density. Naturally this oil from the Castleberry will migrate to the east side, won't it?

A. If the density east of Mr. Rowan is a great deal more dense than his and the withdrawals correspondingly are more then they will be—he will gain less oil by repressuring.

Q. Because it will migrate to the east?

A. That is right, it will be captured over there before he has a chance to recover it.

Q. Now, Mr. Cottingham, you state that Mr. Rowan has as much oil under his lease as he had in the beginning?

A. No.

422 Q. What did you state?

A. I stated he had as much oil under his land today, less on the various estimates given by Mr. Rowan, of from six to eight thousand barrels.

Q. All right, then east of Mr. Rowan's well, at least to the extreme feather edge of the field, does all of that area have practically and ratably the same amount of oil that it had originally?

A. If it is above 755 pounds absolute it is practically the same. They have acquired under their land by drainage the same as Mr. Rowan has.

Q. Then, Mr. Cottingham, if Mr. Rowan is not permitted to withdraw the amount of oil that he has under his lease that is recoverable then that oil will migrate to the east, will it not, if the movement is towards the east? Can you answer that yes or no?

A. I can't answer that yes or no.

Q. You can't answer that yes or no?

A. No.

Q. All right, can you answer this yes, or no: if only a certain—I will ask you this question: as the allowable is reduced, of course the allocation to the wells will be reduced, will it not, accordingly?

A. That is right.

Q. Is the allowable going to decline, going to be on a constant curve from now on out due to recoverable oil and waste conditions and drop in bottom hole pressure?

A. I don't believe I got your question. 11

423 The Court:

I don't see how he can answer that question.

Mr. Tilley:

I beg your pardon?

The Court:

How can he answer that question?

Mr. Tilley:

Because he has stated that the bottom hole pressure constantly declined.

The Court:

You asked him what the allowable was going to be in the future?

Mr. Tilley:

Yes, sir.

The Court:

Can he control that?

Q. If the Railroad Commission continues to respect the waste statutes and they are the same as they are now, will the allowable come down on a constant curve?

A. In other words, if the Railroad Commission, you mean, maintains a top allowable of the field in the interest of conservation?

Q. Yes.

A. And that there are more wells drilled in the intervening time will the allowable remain the same, is that your question?

Q. No. You based the allowable for the field not by the number of wells, do you not, but by whether or not a certain amount of oil withdrawn daily will cause unnecessary waste?

A. That has been the practice because the field has a critical rate of production which the Commission feels beyond which will create physical waste.

424 Q. Mr. Cottingham, the bottom hole pressure is constantly declining, is it not?

A. It has declined throughout the years.

Q. And the oil constantly withdrawn, leaving less oil?

A. That is correct.

Q. And I only ask you that question to determine whether or not the allowable is likely to decline?

A. For which lease?

Q. The whole field, the daily allowable.

A. This is from month to month?

Q. Yes, from year to year, say from year to year?

A. I don't believe you can project it from year to year. I believe you can project it from month to month because we take bottom hole pressure surveys and if it nose-dives we bring it back. But back to your question, if the new wells gradually declined, the amount of wells that can't make the allowable and the wells that are going dead and being plugged and abandoned is increasing there will come a time when the new well allowable will be less than that which is increased by reason of wells going out of the picture and those that can't make the marginal allowance.

Q. For the last three or four years has there been a general decline in daily allowable for the East Texas field over the year, an average per year?

A. Per year?

Q. Yes.

A. That is right.

425

Q. All right.

A. All over the State.

Q. Now, at the present time the market demand is less than the amount of oil that you can produce throughout the State of Texas without causing unnecessary waste, isn't that right?

A. This field could produce the entire market for Texas at the present time, but it would create physical waste.

Q. Is there enough oil that could be produced daily in Texas now in excess of what the actual market demand is? In other words, you are producing now the amount of oil daily which is equivalent to the market demand, are you not?

A. We could produce more oil today without creating physical waste than we are producing.

Q. That is my point. Now, you state that—

A. I say physical waste, within reasonable limits.

Q. That is right. Let's take this map we had a moment ago, the potential map, or we can use this potential here. You state that potential as taken by the Railroad Commission reflects permeability, porosity and sand thickness and those factors?

A. Pressure.

Q. Pressure.

A. And possibly position on structure.

Q. All right, would a potential therefore reflect a condition in the sand such as shale lenses and things of that kind?

426 A. Yes, sir.

Q. Would it take into consideration permeability and porosity as you say?

A. Sure, that is one of the factors, two of them.

Q. Now, are the shale conditions in the south part of the field fairly uniform throughout the south part?

A. No, sir.



Q. They are not?

A. No, sir.

Q. They vary?

A. As evinced by this map here. The greatest thickness is in here; the greatest potentials are in here.

Q. All right, I will ask you this question, Mr. Cottingham: you have potentials here varying from 700, 900 on down to 100 and practically nothing on the east?

A. To dry holes.

Q. Yes. Now, will you show me the shale conditions throughout the field as reflected by your potential map? Will you show me the variations in shale, where the shale is in the sand and whether permeability and porosity varies, according to your potential map?

A. The potential map reflects four factors. One of them—

Q. That is not what I asked you.

A. I am coming to your question. One of them is sand thickness, and if you have an impervious portion of the section that is not contributing to oil flowing into that hole that reduces the sand, the effective sand thickness.

Q. Mr. Cottingham—

427

A. And that is reflected in the potential.

Q. Let's take this map here. Now, Mr. Cottingham, step right over here, will you, please?

A. Yes, sir.

Q. Here are your contour lines on the east in the East Texas field. Down in the south end you say that there is a lack of uniformity in the south end of the field in sand conditions, permeability and porosity and there is lots of shale and it is uneven?

A. Yes, sir.

Q. I want you to tell me just exactly where that is shown in your potential map.

A. It is reflected in the size of the potentials. Where you have the greatest sand thickness, as shown here, as along this line, the greatest potentials as along this line.

Now, you are dealing with four factors and possibly five, and as those factors change your potentials change. You might have a great deal thicker sand and it might be very tight and you will have a very small potential.

Q. Mr. Cottingham, you are not answering my question.

A. I beg your pardon.

Q. What does bottom hole pressure reflect besides pressure, if anything?

A. Pressure, permeability, porosity and sand thickness.

Q. Then you could substitute that for potential if you wanted to?

A. No, you have to take four factors.

Q. What does it reflect, permeability, porosity  
428 and sand thickness?

Mr. Mahon:

I don't think the question is plain.

Q. All right, what does bottom hole pressure reflect?

A. Bottom hole pressure reflects the amount—you run a gauge in the well—

Q. A bomb they call it?

A. A bomb, and it reflects how much pressure per square inch is down there at that particular level.

Q. Does it reflect—

A. And it is one of the elements or one of the factors, bottom hole pressure, of potential, it is one of the four main factors.

Q. But what does it show other than pressure?

A. Which, bottom hole pressure?

Q. Bottom hole pressure.

A. It just shows pressure.

Q. It doesn't show permeability, it doesn't show porosity?

A. No.

Q. It doesn't show anything but pressure?

A. That is all it is designed to show.

Q. Now, show the Court, Mr. Cottingham—this is a potential on what well? This is a potential test on well number what?

A. Well, let's pick out one here.

Q. No, let's pick out this one here. Sixty-nine, is it? Well, it is in the south end of the field. Now, how far is it from that well to the extreme east side of the field?

A. Let's see, this is 1,000 feet—2,000 feet—no, 1,000 per inch, is it, now?

Q. Your scale is one inch to 2,000 feet.

A. All right.

Q. Tell me how far that is.

A. From this well?

Q. Yes.

A. This is approximately eight inches, and that would be—

Q. 16,000 feet?

A. 16,000 feet.

Q. Now, in that 16,000 feet I want you to tell me whether that sand is ten feet thick or twenty feet thick or whether it has a degree and percentage of thirteen per cent porosity or just exactly how much shale it has, or tell me anything that you can from that map about sand conditions in that area.

A. I am pretty sure that on the east side of that well that the sand is zero thickness, from available data that we have, and in as much as this well is in the longitudinal—

Q. I want to know from this map what this map shows you.

A. This well don't show how thick the sand is.

Q. It does not?

A. No.

Q. It doesn't show the condition of the sand between that well and the east side?

A. No.

430 Q. Then any consideration you give to these wells is by virtue of potential and not by fact?

A. No, by extropulation, only by extropulation.

Q. What do you mean?

A. We have zero and a good well here and we know by extropulation between those two that—

Q. You conject as to what that is, don't you?

A. It is a problem of extropulation.

Q. That is right, you don't know and you have made no test to tell what the condition in that area is, or any of the rest of the East Texas field from these potentials east or these potentials west, have you?

A. We have asked the operators—

Q. Mr. Cottingham, I am not asking you what you asked the operators, I am asking you from your potential test have you been able to glean any information with reference to shale conditions in the sand and such things as that?

A. No, not from potentials.

Q. Now, you have 25,000 cores in your office or in your Commission, do you not?

A. No.

Q. You have logs of 25,000 wells, have you not?

A. Drillers' logs from six inches in depth to through the entire Woodbine section.

Q. Now, through those cores or those logs could you go and determine the inaccuracies in reference to sand thickness, if you wanted to determine that?

A. No, sir.

Q. You could not?

431 A. No, sir.

Q. Could you take Schlumbergers and determine it?

A. For this reason, in the early history of the field—

Q. I withdraw the question. I say within a reasonable degree?

A. No, we can't.

Q. What is the variation between the sand thickness in the East Texas field? Does it go from one foot to one hundred?

A. That is right. It is a little more than one hundred. Not effective Woodbine, but from zero to 120 feet.

Q. In the Woodbine sand itself?

A. Yes.

Q. Now, in the sand contour map you saw how did they draw those contour lines, every ten feet?

A. I don't recall which map.

Q. You said you had seen a map, a contour map.

A. I will have to ask Mr. Hudnall.

Q. Have you looked at his map?

A. Are you referring to the isoback?

Q. Yes.

A. Ten foot.

Q. Ten foot. Then your chances of mistake in a sand thickness map would be from twelve to one, would it not, because it would go from one foot sand thickness to 120 feet on ten foot contour lines, would it not?

A. I didn't get that question.

Q. If you would draw contour lines for a sand map for every ten feet of sand is what I mean you  
432 would have a variation thereof—for mistake—of twelve to one?

A. Why twelve to one?

Q. Well, you have only twelve contours if you got a maximum of 120 feet, is that right, if you drew those contour lines every ten feet for every ten feet of thickness?

A. Assuming that the 120 feet was pure sand it would be twelve to one.

Q. Well, take the Woodbine.

A. If that 120 feet was pure sand you would be correct.

Q. There is very little area in East Texas, in the East Texas field that is more than 100 feet of Woodbine sand, is that not so, the whole Woodbine formation?

A. That is right. This map here delineates, the red line delineates the eighty foot isoback.

Q. All right, that is the eighty foot?

A. Yes, sir.

Q. All right, now in your potential you have a variation from a potential of one barrel an hour to 950 barrels an hour, do you not?

A. Wells that—

Q. Your highest potential is 1,100 something, isn't it?

A. That is correct.

Q. Then you have a variation for mistake of 1,100 to one, do you not?

A. A mistake?

Q. You have a chance of mistake of 1,100 to one?

A. The variation in ability of the wells to produce in the East Texas field might be one barrel per hour to 1,100 barrels per hour.

Q. Now, Mr. Cottingham, let's get back to the map. Let's take Schlumbergers on this area, any part of the area in here, to determine within a reasonable degree the sand thickness and permeability and porosity of a well say where I am pointing my finger; and go 2,000 feet and take another one and draw lines on that, and would they be as fairly accurate as the lines you have drawn?

A. You mean to delineate what?

Q. Just take a well with the Schlumberger test that you have of it, over here halfway between the potential test you have taken on the extreme east side, and protract that line like you have protracted your potential lines, would you not have a greater degree of accuracy in those lines than you have in your potential lines, because you have not only the Schlumberger, but you also have the log record in the Railroad Commission of all of those wells?

A. What does the Schlumberger log reflect?

Q. You testified that it reflected water, permeability, porosity and what not.

A. I didn't testify to that.



Q. Well, I will ask you what you did testify to. I am sorry. What does the Schlumberger reflect?

A. It shows conditions of porosity and it might reflect the saturation points and permeability—not permeability, but saturation—and—I mean porosity and saturation.

434

Q. Then you could—

A. And water.

Q. Then you could take these Schlumberger tests and determine where your water was and the general sand conditions with a reasonable degree of accuracy, could you not?

A. By what token has the Railroad Commission got authority to demand Schlumberger logs?

Q. Have you got a right to demand potential tests?

A. That was an order.

Q. I am not asking you what right you have. Let's assume—

A. We don't have the Schlumberger and never have had it.

Q. Mr. Cottingham, you have an appropriation up there do you not, in the Railroad Commission, to run the Railroad Commission?

A. Yes, sir.

Q. You take bottom hole pressure tests, don't you?

A. Yes.

Q. How do you take those?

A. We send engineers out and they take them under certain orders of the Railroad Commission.

Q. Now, if you have an order of the Railroad Commission and an appropriation to take Schlumbergers then you can take those Schlumbergers and you can draw your potential lines?

A. We might order it, but I don't know whether we could get it.

Q. Is it physically possible?

A. Oh, yes, the Commission can order it, but  
435 I don't know whether we could get him to obey  
the order.

Q. They can be taken by the major companies, can  
they not?

A. Oh, yes, they can be taken by independents.

Q. They are taken throughout the State, aren't they?

A. Yes, but I don't know how many Schlumberger logs  
have been taken in this field.

Q. Now, this is argumentative and I withdraw the  
question. But I will ask you if those tests are taken what  
they would reflect and if they reflect these conditions  
which you speak of could you draw contour lines showing  
the general sand thickness and permeability and porosity  
throughout the East Texas field?

A. Generally the Woodbine sand is composed of a suc-  
cession of shale lenses, sand lenses, volcanic ash lenses.  
Some of those lenses are very short in distance; some of  
them are of considerable magnitude.

Q. Yes.

A. Now, who is going to interpret between 200 foot  
distances in this field and throughout the field all of the  
elements reflected in the Schlumberger log?

Q. All right.

A. Now, you might be—

Q. Just a minute.

A. Just a minute. Will you permit me?

Q. Yes.

A. You might go ahead and have all the Schlumbergers,  
but I am just wondering if that wouldn't just  
436 clutter the whole picture up if you had a Schlum-  
berger for each well in the field.

Q. Mr. Cottingham, the more Schlumbergers—

A. Because sometimes an offset well will get four or  
six feet of impervious material and the next well don't  
get it.

Q. All right, when you have a potential, when you got a potential that didn't look right when you were taking these potentials you threw that out, didn't you?

A. We held some in abeyance and they drilled another well and we found out it was correct.

Q. Now, could you throw those same tests out if they were Schlumbergers? You threw the potentials out in order to make your contour lines?

A. No, we didn't throw any potentials out there.

Q. You threw some out in the field?

A. Not here. We held one in abeyance because we didn't think that that particular well could produce that much oil through that, so we held it. He drilled another well and it produced the same amount.

Q. Now, Mr. Cottingham—

A. It was an offset well.

Q. The more information you have about sand conditions down there the more accurate your map will be, is that not true?

A. Yes.

Q. Then if you have Schlumbergers on a reasonable number of wells you can draw a reasonable number of contour lines?

437 A. What is a reasonable number? .

Q. A reasonable number, seventy-one; seventy-one.

A. Does a Schlumberger—

Q. I am asking you questions, Mr. Cottingham.

A. I am saying that a Schlumberger doesn't reflect permeability, porosity, sand thickness always. It almost always reflects sand thickness and—

Q. Mr. Cottingham, I didn't ask you that.

A. I am sorry.

Q. I am awfully sorry you misunderstand. I asked you what information—I will ask you again, what information will it give you?

A. A Schlumberger?

Q. Yes.

A. It shows within a radius, according to Mr. Buck of six feet around the well, what conditions obtain there.

Q. That is right.

A. With reference to porosity and saturation and water.

Q. Porosity, saturation and water, water?

A. Right.

Q. Then by those you can tell the water table, can you not?

A. That is right.

Q. Then by those you can tell the permeability and porosity and thickness, can you not?

A. The water table is reflected here.

Q. All right, you know where the water table is in the East Texas field. Then you know where the top of the sand is in the East Texas field?

438 A. The water table, we know it is variable, from whatever those distances are, over a distance of about seventy feet.

Q. Ali right. Now, Mr. Buck has prepared a sand map based on the cores of wells and Schlumbergers. Would you say whether or not that can be done accurately or whether or not you would give any credence to that map if it were so made?

A. Well, if it is based on cores, Schlumbergers, I would say that he could supplement it by well logs and it would be perfect.

Q. It would be perfect?

A. Yes.

Q. Then is there any reason why the Railroad Commission can't do the same thing?

A. Oh yes, they can construct the map.

Q. Now, Mr. Cottingham, let's get back to the question as to whether or not potentials show oil reserves under a particular lease. Is it your answer that it does show that?

A. It does.

Q. It does?

A. In some measure. It is one of the factors.

Q. All right.

A. First you have to have a well on the tract before you know whether you have any oil under there.

Q. That is right.

A. And second if you—the magnitude or the value of the oil land is based on whether you have a ten  
439 barrel well or a thousand barrel well or what.

Q. That is right.

A. So in that relationship it does reflect something about reserves. It is one of the factors.

Q. Mr. Cottingham, I have drawn you a picture of a ten acre lease immediately adjacent to a one acre lease in the East Texas field. They are in the Fairway. It has a potential, according to your map, the one on the ten acres does, of 960 barrels an hour. The wells were equipped exactly alike. They were drilled to the same depth. The sand conditions are exactly the same as near as there can be exactness in any oil field. Will a potential test taken by the Railroad Commission in the manner that those tests were taken reflect the recoverable oil under each of those two tracts?

A. It is only one of the factors. It doesn't reflect the—it is only one factor.

The Court:

Don't they have to take acreage into consideration?

Mr. Tilley:

That is right.

The Court:

Let's get to it without going around so much.

Q. Then, Mr. Cottingham, you state it does not take into consideration the recoverable oil under those two respective tracts?

A. Potential?

Q. Yes, sir.

440 A. It is one of the factors. You mean that the two wells are exactly the same or you have a ten barrel well and a 1,100 barrel well, per hour?

Q. I will ask you this question, Mr. Cottingham; then does the Wood tract of one-tenth of an acre or do the Wood tract of an acre and the Rowan & Nichols tract have the same quantities of oil under them in your opinion?

A. No, I don't think they have the same quantity of oil.

Q. All right, does the five acres immediately adjacent to the Wood tract have as much or more oil than the Wood tract?

A. No, but I think that your permit on one-tenth acre has as much oil as the Wood tract.

Q. You mean the well has?

A. It would if you would drill that well.

Q. Is there as much oil under the tenth of an acre as there is under the five acres immediately adjoining if both have a permit and a well on them?

A. You have a permit on one-tenth acre, have you not?

Q. Yes, sir, and I have a permit as a direct offset to it on five acres. Now, does the five acres have more or less oil or the same amount of oil as the one-tenth of an acre next to it?

A. It is reasonable to presume that the five acres has more oil than the one-tenth acre.

Q. How much is more oil?

441 A. I wouldn't express it in terms of percentage.

Q. Now, Mr. Cottingham, if you had wanted to give any consideration to the recoverable oil over in the



East Texas field, since you had contour lines drawn showing the potentials of those areas, would or would it not have been a very simple matter to multiply the surface area times the potential to estimate the relative amount of oil each man was entitled to if he was permitted to recover the oil or equivalent of the oil under his particular tract?

A. You mean A times P?

Q. Yes, acreage times potential.

A. Let me have your question again, please. (Question read.) It would be a very simple matter to do the multiplication. Whether or not the recoverable oil in one tract bore the relationship to the recoverable oil in the other tract I don't know.

Q. Would the Wood tract and this one, take them together, would it work there?

A. Assuming—

Q. Acreage times potential.

A. Assuming any condition?

Q. Assuming what your potential map shows.

A. Acreage times pressure?

Q. No, acreage times potential.

A. Acreage times potential. It might or it might not.

Q. It might or it might not?

A. That is right.

Q. Well, why wouldn't it?

442 A. You can't always tell just the exact amount of shale. It would be reasonable to presume that it would closely approximate it.

Q. Your potentials show they have the same sand conditions, don't they, because they are the same?

A. That is correct. It would closely approximate it.

Q. And the same thing would be true all over the field, would it not, Mr. Cottingham?

A. That is right.

Q. All right. Now—

A. Now, this—

Q. Let me ask you this question, Mr. Cottingham—

The Court:

Counsel, this has been the most liberal fifteen minutes the Court ever saw.

Mr. Tilley:

Your Honor, I had no idea it would take me this long to get answers out of the witness.

The Court:

I think the witness has been fair.

Mr. Tilley:

I mean he has been lengthy.

The Court:

You are going into a great deal of detail that I don't see how it can have any bearing on the matter. You will have to get down to some broad general principals because the Court is not going to substitute his discretion for that of the Commission. You have to show that the way they have administered this is so wrong as to be confiscatory. So I don't see that we are getting anywhere by speculating whether it is a little better to do it this way or that way. It seems to me that  
 443 there are some fundamentals here that haven't been gone into. I presume Mr. Cottingham has—  
 I would like to ask him one or two questions and then I would like for you to bring your examination to a close. In preparing this order do you take any cognizance of acreage? Is that considered, do you know?

The Witness:

Not any more than the spacing plan provides.

The Court:

For instance, take this Rowan lease, as I understand it that twenty-five acres is practically the same, the thickness of sand, porosity, permeability and so forth are relatively the same on the Rowan lease?

The Witness:

Yes.

The Court:

Now suppose instead of being one ownership it was two. One man had twelve and a half and another man twelve and a half. One man brought in one well on his twelve and a half acres, a good strong well, and the other people drilled five or six wells on their land. How would you adjust it between those two people? Would that man be entitled to his one well, if it was capable of doing it, of getting his oil out under his twelve and a half acres, or would he just get one-fifth, if the other fellow had five wells?

The Witness:

No, he would be given—that particular well under the present scheme would be given, allocated its part according to its potential.

444 The Court:

I know, but suppose the potential on all six of the wells was the same?

The Witness:

They would all be given the same.

The Court:

Then the other people would get six times as much as the one with one well?

The Witness:

That is correct.

The Court:

The same size tract of land?

The Witness:

Yes, sir.

The Court:

And the same amount of oil reserves?

The Witness:

That is correct.

The Court:

Then you don't take acreage in as a factor?

The Witness:

No.

The Court:

As far as this order is concerned?

The Witness:

What is that?

The Court:

As far as this order is concerned you don't take acreage into consideration?

The Witness:

The spacing pattern takes acreage into consideration, but allowable is purely on potential.

The Court:

Over in the eastern part of the field the spacing is creating a disturbance?

The Witness:

I didn't understand.

The Court:

I say the spacing over in the eastern part of the field is practically gone, isn't it?

The Witness:

It has practically resolved itself into an exception to the spacing rule.

The Court:

I didn't understand what your idea was about that. How do you consider that?

445 The Witness:

Any common yardstick applied in any proration formula will possibly work an apparent hardship to one operator against another, but you can't apply it if you put just straight acreage into effect.

The Court:

I was just wondering whether you disregarded it altogether or not?

The Witness:

We have on the one hand a top allowable beyond which most engineers feel that physical waste will result if that is not maintained. Now, on the other hand we have 25,900 wells in the field. Now, if some of those wells are caused to flow more, by setting an arbitrary limit, beyond which we can produce, a certain amount of oil will be irretrievably lost, so the Commission is between, you might say, a rock and a hard place. There are some things you can't take into consideration. They have the limit, so far as the field out there is concerned they have the lower limit, beyond which I don't know whether they can reduce the wells.

Q. Mr. Cottingham, you stated that there were certain things that you could not take into consideration. Now, you were talking about the marginal well bill?

A. I am not a lawyer. I wouldn't know whether it is valid or not.

Q. You meant that if you went ahead and gave twenty barrels to each well and a minimum to those wells that could make it, then of course you could make an adjustment, is that right?

446 A. I don't believe I get your question, Mr. Tilley.

Q. I will ask you this question, Mr. Cottingham: the allowable for the East Texas field is approximately 500,000 barrels a day?

A. No, it isn't that much.

Q. How much is it now?

A. I will have to refer to—it is very much less than that. As your engineer recollected 400,000, and it is a little less than that at the present time. I think I have the figures here of what it is in February. The allowable assigns twenty barrels to each well that can make it, and twenty barrels of marginal oil and about 7,000 barrels of prorateable oil totals 522,863 barrels.

Q. That is what I said, Mr. Cottingham, that is what I asked you.

A. But the Commission has a Saturday and Sunday shutdown during the month of February, in which there are eight days. Then the allowable for the East Texas field is 373,473 barrels as of February first.

Q. Now, Mr. Cottingham, if you would reduce it one more day, if you would close in the field one more day per week, then you could then increase the monthly allowable, you could increase the allowable per day that way over the month so that you could then give a bigger variation in allowable to the bigger wells than you would the smaller wells, could you not?



A. The Commission could, I couldn't.

447 Q. Then that does not keep you from giving a wider variance in the worst well or practically the worst well in the field and the best well in the field?

A. The Commission could.

Q. Then the East Texas field could be taken off of a practically per well basis by closing in that field, as you are now doing, one more day a week and in that way then you could give the additional oil to the best wells in the field, is that not right?

A. We could just produce it one day and do just as you say if the Courts would permit us.

Q. Now, do you know what the interpretation of the Railroad Commission is as to what the marginal well bill requires them to do or how they have been interpreting the marginal well bill in fixing their allowables for the East Texas field?

A. I wouldn't speak for the Commission.

Mr. Hart:

We object to that as being irrelevant and immaterial.

Mr. Tilley:

All right, I will withdraw that question.

The Court:

I don't know that the bill is under attack here in this suit, is it?

Mr. Tilley:

Yes, sir.

The Court:

Well, the method of its application and enforcement would be material, wouldn't it?

448 Mr. Hart:

I didn't understand it was under attack.

The Court:

Overrule your objection.

Q. What is the interpretation of the Commission as to the meaning of the marginal well bill as applied to the East Texas field?

A. All I can answer is I can't answer for the Commission's interpretation of the marginal well bill only in so far as they have, in the interest of conservation of the field, in setting the top allowable for the field, have closed the field—by reason of the fact that to grant each well the marginal well allowance would result in physical waste if all the wells in the field were given twenty barrels a day—they have indicated that in the interest of conservation that they would close the field down on Saturdays and Sundays or the equivalent amount. They would not necessarily close the field—let me correct that statement. The field operates pretty uniformly. There are several gasoline plants over there and the operators are permitted to operate their wells continuously to supply casinghead gas to these gasoline plants, which in turn supply gas to 50,000 people. And so they have a provision in the break-down order which provides for a continuous operation, but to curtail the production during January 8/31st of the production and during February 8/28ths, or eight days in each month.

Q. Then there are wells producing in the East Texas field less than twenty barrels per day, is that right?

A. All of them are.

449 Q. There are some producing less than twenty barrels per day?

A. By reason of the Saturday and Sunday shutdown. If you will divide 25,765—no, 25,807 into that figure I gave you awhile ago it will give you about fourteen barrels, I

believe, for the lowest well that can make fourteen barrels.

Q. You know as a fact, do you not, that the Railroad Commission fixes an allowable of twenty barrels per well per day for every well in the East Texas field that will make twenty barrels a day, regardless of any other conditions over there in the East Texas?

A. If it can make twenty barrels.

Q. If it can make twenty barrels a day?

A. It is so indicated on this schedule.

Q. That is your application or the Commission's application of the marginal well bill to that field, is it not?

A. It is placed on the schedule at twenty barrels and then the Saturday and Sunday shutdown, as previously explained, applies across that.

Q. Then if you multiply seven times the allowable and apply that weekly allowable for the whole week instead of five days a week your wells will be making on an average of less than twenty barrels a day will they not?

A. If you multiply the wells by seven?

Q. Yes.

A. Well, there are—

Q. You multiply the allowable, the daily allowable by seven, the actual amount that they are producing per week under the allowable for the East  
450 Texas field, multiply that by seven and divide it by the number of wells and you will get for the 21,000 some odd wells over a seven day week less than twenty barrels per day, will you not?

A. You mean to say that are the wells now getting less than twenty barrels that can make it?

Q. I say the 21,000 wells are getting twenty barrels five days a week. Now, if they were getting the same allowable seven days a week they would be getting less than twenty barrels per day?

A. If the Sunday shutdown was distributed over seven days a week?

Q. That is what I mean.

A. I believe that the majority of the wells would be producing less than twenty barrels.

Q. That is right. Now, Mr. Cottingham, there are some wells producing on the pump as little as five or ten barrels a day and operating aren't there?

A. There are 451, of which the size I can't give you here, that produce—that are incapable of making their marginal allowance of twenty barrels. They average only 11.6 barrels, and the Sunday shutdown applies against those wells.

Q. And there are quite a number of wells making less than five barrels?

A. I can't answer you on the number, but that figure is available in our Kilgore office.

451 Q. All right. Now, Mr. Cottingham, in the reducing of the allowable of those wells so they now produce about ten barrels a well is that creating waste in the East Texas field?

A. I would have to have the individual well and make an analysis of that. I am sure that some wells possibly should not be producing large quantities of water, but I don't know how we can stop it.

Q. All across the whole field there it is not creating waste generally in the field?

A. An overall picture of the field, I think the East Texas field is the best regulated field that has ever been regulated, from an all over picture.

Q. From the standpoint of waste?

A. From the standpoint of waste, yes.

Q. The submarginal wells, are they reduced to five days a week too?

A. All of them are in the State of Texas unless given special exemption, and I know of but one or two wells in the East Texas field that have been given special exemption by reason of large quantities of water.

Q. Now, Mr. Cottingham, there are other fields in the state which are allocated by the potential times acreage, aren't there?

A. Yes.

Q. Now, if there are 251 such orders in Texas why would not that same order apply to the East Texas field?

A. I said that there were 251 wells in Texas—

452 Q. Fields?

A. 251 fields in Texas that are producing on a per well basis, of which the East Texas field is fast approaching a per well basis.

Q. Yes. Now, do you have numerous fields in Texas that you allocate the allowable on an acreage times potential basis?

A. We have none.

Q. In truth and fact you do have because those fields have uniform spacing rules and they are very strictly abided by and you have uniform distances between wells and property lines?

A. In which?

Q. In these fields wherein you consider acreage by virtue of the fact—potential by virtue of the fact that you have uniform spacing?

A. We have sixty-six wells—fields in Texas that are prorated on marginal plus potential. I don't believe that you could pick sixty-six wells in Texas that would have uniform spacing conditions.

Mr. Hart:

Fields?

A. I mean fields.

Q. Mr. Cottingham, if the East Texas field had been developed on the spacing regulation promulgated for that field, that is 330 feet from wells to property lines and 660 feet between wells, would not have that order, together with potential if potential means what you say it does, would not that have put the East Texas  
453 field in effect on an acreage times potential basis?

A. If the acreage pattern in the East Texas field had been uniformly sectionized, large ownerships, but on the contrary, as Mr. Buck explained—

Q. Answer my question, Mr. Cottingham, please.

A. Okeh. Thank you—pardon me. If it was uniform it would be straight acreage.

Q. It would be straight acreage times potential?

A. What is that?

Q. Times potential if you gave consideration to position on the structure which the Courts have talked about, and you had uniform spacing throughout that field, then you would give consideration to acreage times potential, which is the ability of a man's well to produce times the amount of oil underneath his tract, is that not right?

A. Mr. Rice, I do not pass on the merits of these various spacings and I don't know what kind of factors would obtain, but I do know that the East Texas field, if we had back of us all of the experience we have now and could start out it might be an entirely different picture, but we have it obtaining as it is today and we can't change the pattern.

Q. Mr. Cottingham, I understand that, but when you deviate from that spacing regulation and grant some 19,000 exceptions or 16,000 exceptions to that spacing rule do you not then take it off of an acreage times potential basis where you have uniform spacing and drill 454. so many wells that in order to give a man what he is entitled to or the amount of oil equivalent to that which underlies his lease you have to then estimate some way or figure out some way to give him his oil when you take it off a well basis?

A. You don't take it off an acreage potential because that has never been—you would take it off a primary acreage basis, and we have, I think, only one field that has a strictly acreage basis, and it incidently does—I will refer to my map—have a somewhat uniform spacing pattern.



Q. Mr. Cottingham, if you would take the East Texas field and multiply surface acreage which you know, do you not? You know the surface acreage from your map?

A. Oh, yes.

Q. Multiply it times the potential and would it not have the same effect as how the allowable would be allocated in the East Texas field if you had uniform spacing of 330 and 660, with few exceptions?

A. No.

Q. Why would it not?

A. If it was absolutely uniform, yes; if there were no exceptions it would be exactly the same.

Q. It would be practically the same if you even took into consideration the small tracts in the field?

A. It wouldn't be in East Texas.

Q. East Texas was cheap land, was it not, when that field was discovered?

455 A. It wasn't cheap long.

Q. I know, but it was at that time though; those farms over there were from fifty to sixty acres, were they not?

A. It was cheaper than that before oil was discovered.

Q. I am not asking you that, Mr. Cottingham. I just asked you whether or not the East Texas field was divided into farms and large tracts over there before oil was discovered?

A. No, there was Negroes, and it was one of the most mixed up title situations that ever existed.

Q. I am talking about sizes of tracts, not titles.

A. I am talking about sizes of tracts too.

Q. That is right.

A. Partitions where you had somebody that didn't record the deeds; and you had a lot of illegitimate children and they married without getting divorces and they would run the lines from one original survey and some would run from the other and they had overlaps, they had vacancies. It was the terrible mess that was ever known in title surveys.

Q. Rule 37 was promulgated in 1919, wasn't it?

A. I think so.

Q. Now, where that same situation prevailed in the Houston field the Railroad Commission caused them to unitize, didn't they?

A. Houston okeh. The South Houston City ordinance which did that in the protection of life and property.

456

Q. Now, Mr. Cottingham, you know of your own knowledge that the Railroad Commission has granted two to three to four to five wells on one lot owned by one man in Kilgore and London and throughout the whole East Texas field?

A. I know that condition obtains, but I don't know the facts.

Q. Now, the more wells you drill on those tracts the more oil somebody is going to get, is that not right, of somebody else's?

A. That is right.

Q. Under the present.

A. It is axiomatic.

Q. How does the present plan of proration attempt to take care of the other operators who have drilled on a reasonable basis and tried to get only their own oil, as compared with those people that have acted in a spirit of greed?

A. I wouldn't substitute my opinion for the Commission's opinion. As I have stated, I don't know the condition obtaining that caused the Commission to grant these permits, but I know that all permits were granted after due notice of hearing as provided by law, and that they granted them.

Q. No operator in the field except an adjacent tract has a right to knowledge of those grants, has he?

A. I wouldn't know that.

Q. You know the policy of the Railroad Commission is not to give anybody notice of that except the immediate lease owners, you know that?

A. That is correct, those that are directly affected. I think the law prescribes that.

Q. Those immediately adjacent to that lease?

A. They wouldn't issue notices of hearing to the 11,000—I mean more than 1,100 separate and distinct operators in the East Texas field. They could if anybody requested it, and there are certain agencies that get all those permits.

Q. You mean there are certain persons that practice before the Commission?

A. That is right, certain people that request them and they are given those permits or they are available to them at all times. The office is open to anybody in Austin here.

Q. Now, Mr. Cottingham, can you tell this Court why the Railroad Commission granted as many as five or ten permits on one single acre owned by one single man?

A. Ten?

Q. Yes, sir, ten?

Mr. Mahon:

Your Honor, we object to that.

The Court:

Sustain the objection.

Mr. Mahon:

We object to any of this line of questioning.

The Court:

I can't give you a blanket suspension here. I sustain the objection to that one question.

Q. I will ask you this, is it in contravention of waste?

A. What?

458 Q. Would the granting of permits for five wells on one acre in the Kilgore area, would that be conducive to or preventive of waste?

Mr. Hart:

We object to that as being a collateral attack.

Mr. Tilley:

One moment, please.

The Court:

These orders have to act prospectively and the Court has to act on them prospectively. I can't say this present order is invalid because you have done something wrong in the past, if it be true they have done something wrong. You have 25,000 wells here. You can't try each one of them. We have to face a condition here as it is. The Commission has these wells and they have to write an order. If they write an order that operates in such a discriminatory fashion as to constitute taking of one man's property let him come in and show it, but I don't understand you can upset the whole thing on that unless the order is void on its face. You are trying out an awfully wide swath here and you are fixing to try matters that I am not interested in. The question about the Commission granting these permits, they are granted, they are there.

Mr. Tilley:

All right, I will refrain, your Honor.

The Court:

If the fact they are there operates to make this order bad we will test the order out by the facts as they exist now.

Q. Now, Mr. Cottingham, you stated that if any person was dissatisfied with a potential given his well  
459 that he could come to the Railroad Commission and ask for a new potential to be taken?

A. Anytime that an operator felt that his well was not in the proper brackets according to this potential map the Commission was always willing and ready to take the potential of his well and let his well rest on what it showed.

Q. Now, Mr. Cottingham, confiscation of an operator's property over there is caused not because his particular potential may not be what it should be, but because somebody else's potentials are higher than they should be. Now, it costs about \$1,000.00 apiece to take those potentials, does it not?

A. It didn't cost the operator one red cent because in as much as it was a community proposition and in as much as it was a common reservoir the Commission granted each operator the amount of oil, after he would make an inventory at his expense to take the potential, they would let him run that much oil to pay for the taking of the potential.

Q. He is taking oil then while the other wells are closed in, is that it?

A. No, the potentials were taken under operating conditions.

Q. I mean he is taking a thousand barrels of oil more than other operators are permitted to take?

A. Yes, but it was a kind of community proposition. He didn't get any benefit for taking it because he was given a quantity sufficient to exactly pay for the  
460 taking of the potential.

The Court:

What has that to do with it?

Mr. Tilley:

I just want to show, your Honor, that the method and cost is prohibitive of Mr. Rowan coming in and asking for a potential to be taken on his well or on Wood's well.

The Court:

They have taken potentials on his wells haven't they?

Mr. Tilley:

Yes, your Honor.

The Court:

They have shown they are among the best in the field, they are in the top brackets?

Mr. Tilley:

That is right.

The Court:

And he has filed his application with the Commission to have it done a different way and it was denied and he has filed an application to drill eighteen or so wells and that was denied. You couldn't make the order void because it takes \$1,000.00 to take a potential.

Mr. Tilley:

It goes to the reasonableness of the plan, your Honor, because he has to take not only his potential, but these potentials are admittedly on the east side out of line.

The Court:

I understand that. You have developed that very fully. Now, you have this huge field and thousands of wells and they have only taken a few key wells, about seventy-one, and you say that isn't enough and it is too expensive to



take more. The question of whether that is the  
 461 best way to do it or not you can argue about later.  
 He stated all the facts about it. Don't argue  
 with the witness.

Q. Mr. Cottingham, you have potentials shown there  
 of wells on the east side of from 100 to 500 barrels. Now,  
 most of those wells are pumping wells, are they not?

A. I wouldn't state that most of them are.

Q. A large number of those wells?

A. I would say the poorest wells around the periphery  
 of the structure, that are around the periphery.

Q. Are pumping wells?

A. That is correct; that is what you would expect

Q. Then if those wells are pumping wells, what is the  
 maximum a well can pump in the East Texas field, over  
 there on the east side, per hour?

A. Some of them, you know, have been plugged.

Q. Well, of course I am not talking about a plugged  
 well. I am talking about a well that is pumping.

A. Some of them can pump five or six barrels a day.

Q. What is the maximum.

A. Right on the margin of the field.

Q. Mr. Cottingham, what is the maximum number of  
 barrels per hour that any well on the east side can pump,  
 on the east side of the East Texas field, that is all I want  
 to know?

A. There are hundreds of wells there, and I don't  
 know the exact status of them and nobody would know  
 until they go in there and run a potential test. And let  
 me tell you how long it takes to run a potential  
 462 test—

The Court:

Don't tell him that.

Q. Mr. Cottingham, you don't understand my question, I am afraid. In order to take a potential test on a pumping well all you have to do is pump that well, isn't it?

A. The first thing you have to do in the East Texas field, we have learned by experience, is first to see if the well has been loaded. Then we do that by pumping the capacity of the casing first or until it pumps off. Then you start your test and pump it for twenty-four hours as hard as you can, and that is a twenty-four hour potential test.

Q. Now you still haven't answered my question.

A. I am sorry.

Q. I want to know what the maximum a pumping well in the East Texas field will pump, in your opinion?

A. The maximum?

Q. That is all I want to know.

A. You know there are several types of high pressure pumps. One is a casing pump. That has no tubing and things. Some of those pumps, if the fluid would enter the hole at 3,600 feet it would pump four or five thousand barrels daily. It is owing to the size of the casing and working barrel. If you get a Reeder pump where the pump is down in the bottom of the hole and put on lots of electricity you might pump slightly more than the casing pump. And it is owing to what the oil level, whether it will bring the oil into the hole fast enough.

Q. Then instead of producing four or five hundred per hour they will produce four or five hundred barrels a day?

A. I don't know of a pump that will deliver 500 barrels a day.

Q. All right, what is the highest?

A. I wouldn't make an offhand estimate. I am not an expert in pumping equipment. I know about pumping equipment by coming in contact with people, but I am not familiar with the highest rate pump there is. I know you can deliver more fluid at a lesser depth than you can at a greater depth.

Q. Now, Mr. Cottingham, to all the wells in the field which have a potential of 860 barrels per hour or less, down to one barrel, you give those the same number of barrels per day in allocating your allowable that you give to the Rowan & Nichols Oil Company, which has a well that will produce 20,000 barrels a day?

A. Rowan & Nichols' wells, I believe, average about 22.3 barrels per well, and those wells from the 860 contour line down to zero average, all of them average twenty barrels if they can make it, and if they can't make it they are given what they can make, less Sunday shutdown, but since that map went into—

Q. That is regardless of the size of the tract, whether a hundred acre tract or one acre tract, as long as the spacing is one well to ten acres it doesn't make any difference about that?

A. You mean one well on a hundred acre tract?

Q. Yes.

A. There aren't any over there.

Q. Well, one on twenty.

A. There aren't any over there.

Q. On ten.

A. Unless it is around the margin of the field, and in a spacing rule of ten acres you never assign more than one well unless it is in the center of the field.

Q. I will ask you this question, you give to one well on ten acres in the heart of the field, in the Fairway, that will make 20,000 barrels a day, you give two barrels less to that well on the east side or the east on one-tenth of an acre that will not produce but twenty-one barrels a day with the well wide open or however you try to flow it?

A. I know of no well in the Fairway that is—that has a density of one well to ten acres. They have taken advantage of that and have drilled more wells than that.

Now, around the periphery of the field you will find that.

Q. If there are such wells, Mr. Cottingham?

A. Yes, I stand corrected if there are such wells.

Q. And there are a number of wells over there on small tracts?

A. Yes, sir.

The Court:

Why don't you stay on your own tract? It has to be bad as to you.

Q. Now, Mr. Cottingham, if there is one acre in the Wood tract and twenty-five acres in the Rowan tract and you give to each the same allowable per day you are giving Wood 250 times, per acres, more oil?

A. That is when you apply a common yardstick across the field?

Q. With the order you have right now.

A. You will have those inequities in any order.

Q. This order I am talking about.

A. I am talking about this order or any other order.

Q. Or any other order?

A. Any other order that I know of.

Q. Well, now let's take the Van Field order. Would it—

The Court:

Let's not do that.

Q. I withdraw the question. Now, Mr. Cottingham, is that in your opinion a reasonable allocation of the allowable?

Mr. Tilley:

I withdraw that question. That is all, your Honor.

Mr. Hart:

Before I forget, I want to formally offer the exhibits that have been marked for identification, with the exception of Exhibit No. 21 which is duplicated by 22, except that exhibit. No. 22 is on a smaller scale.

(The above referred to exhibits were thereupon received in evidence, the same having been marked Exhibits 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38 and 39.)

Cross Examination (Resumed).

By Mr. Tilley:

Q. I will ask you this question: under your present plan of proration isn't it a fact that you give a distinct advantage to the Wood tract over the Rowan & Nichols tract?

A. I believe that is obvious, Mr. Rice.

Q. That is all.

A. In that particular instance as you would in any formula that you applied a common yardstick to across the field, of a field the size of the East Texas field.

Re-Direct Examination.

Questions by Mr. Hart:

Q. Now considering the Rowan & Nichols tract not just with relationship to that one isolated tract, but consider it with the average of all the surrounding leases or the average of the leases to the edge of the field on the west or on the east, or considering it in relation to the average density of the field as a whole, is Rowan & Nichols in any disadvantage?

A. I believe their density is a little greater than to the west of them, to the east of them, to the south of them and to the west of them than is the field as a whole.

Q. In other words they are more densely drilled when you consider those averages than are their surrounding tracts?

A. We prepared those break-downs and that is correct, I think that is correct.

Q. All right, then if you would take into consideration an acreage times potential method of allocation they would actually get less share in the oil than they are getting under a straight potential allocation, wouldn't they?

A. Acreage times potential?

467 Q. Yes, sir.

A. We made that calculation and come to that conclusion.

Q. For the reason that they are more densely drilled than the average of the field, for that reason acreage times potential would give them—

A. They would have less allowable than they have now under the present acreage times potential because they are more densely drilled than the field.

Q. Now, Mr. Tilley talked about these persons that drilled up to greater density than their surrounding tracts to get a greater amount. Do you know the history of the Rowan & Nichols tract? Do you know whether they drilled up more densely than the surrounding tracts throughout the operation of that lease?

A. I know that only so far as I heard the testimony of Mr. Rowan, he admitted he led the density of drilling in that area.

Q. So they are not hurt?

A. So far as density, no.

Q. Now, of course the potential does not reflect the acreage of a lease, does it?

A. What is that?

Q. The potential of the wells on the lease do not reflect the acreage?

A. No, you might have a well on one hundred acres or a well on a tenth.



468 Q. So if a man feels he is being damaged because of the fact he is not as densely drilled as his neighbors he is not taken care of by the pro-  
 ration order, but by the rule of the Commission that allows him to drill to the density of the surrounding tracts in order to prevent confiscation?

The Court:

He is granted administrative relief by the Commission and final relief by the Courts.

Q. Mr. Tilley asked you about what might have happened if instead of having two days shutdown you cut them down so they produced just one day a week. Now, wouldn't the effect of that be to cut down on the marginal allowance of these wells so they wouldn't produce enough to afford them to operate and the results would occur which you have already talked about, the wells would be abandoned and wells lost in those instances?

A. It would be designed to reduce the wells on the smaller tracts to a level which they could not produce, which would in my judgment create physical waste.

Q. Just one other thing. Mr. Tilley, I think, asked you some questions which might lead a person to believe that calculating the surface acreage of some of those leases in the East Texas field would be a simple matter. Do you know whether or not as a practical matter it would be very difficult to determine the exact acreage because of disputes between adjoining land owners, as between the dispute between Wood and Rowan?

A. It would be difficult to determine the Wood tract.

469 Q. And aren't there situations all through the field that would make it complicated to give weight to acreage?

A. I don't have that information before me, Mr. Hart.

Q. All right, do you know any two acres in any field that have exactly the same amount of recoverable oil underneath them?

A: Nobody knows. You can't look down there and find out how much oil is there.

Q. Well, there is a variation from acre to acre, is there not?

A. Correct.

Q. And the extent to which you put in an acreage factor, you are necessarily putting in a factor that is subject to error, are you not, because of the variation between acres?

A. Of course in the relationship that one acre varies to another, which is an unknown quantity; there would be that variation.

Q. Because of the density of drilling on the Rowan & Nichols tract are they or not producing more per acre than the average of the whole East Texas field?

The Court:

I think that has been asked a number of times.

Mr. Hart:

I didn't know that particular question had been covered.

The Court:

You might not have asked it exactly in those words, but it has been proved they are more densely drilled.

470

# Re-Cross Examination.

Questions by Mr. Tilley:

Q. Mr. Cottingham, in taking into consideration acreage, if there was some dispute you could have a hearing and adjust that?

A. Well, I don't believe the Commission—

The Court:

That is an argument, isn't it? I have no doubt the Courts could find out where the property lines are.

Q. When you said that the acreage times potential method would give Rowan less didn't you assume some minimum or maximum there?

A. No. I think that can be readily calculated from my breakdown, but I think we calculated it—

Q. You didn't assume twenty barrels for all wells by any chance?

A. I don't know; I am not sure about that part.

Q. Well, you know what you made an important calculation of that kind on, don't you, Mr. Cottingham?

A. Yes, we had the break-down there, and in general terms—I am not sure about that particular thing.

Q. Well, explain to the Court what acreage times potential is. It doesn't give any consideration to the number of wells.

A. Say the potential of the well is a thousand and it has one acre. It is one times a thousand. And suppose you have ten acres and have two wells—have one well on ten acres and it has 300 pounds pressure. That would  
471 be 300 times ten and then you would add all those factors up and allocate on that.

Q. Then to take true potentials times acres you have to give no consideration on any minimum allowable or to the number of wells on that tract?

A. I don't get that?

Q. In order to determine accurately the effect or result of acres times potential you do not take into consideration any minimum allowable or the number of wells on any particular tract?

A. Well, I think if you had a marginal well law and you tried to live under it, A times P would give you twenty barrels. The Commission would be inclined to give that well twenty barrels whether the formula gave it or not.

Q. Yes, you took that minimum then, didn't you?

A. I am not sure really; I didn't make the calculation and I don't know.

Q. Well, isn't it your best recollection?

A. What is that?

Q. Isn't it your best recollection?

A. I don't want to beg the question. I would rather say I just don't know, I don't know the result.

Q. Well, will you multiply that before you come back to the Court and tell the Court whether or not it is 151 barrels instead of 111 barrels?

A. If the Court so directs.

Q. In order to clarify your own testimony and  
- 472 - in fairness to this plaintiff won't you do that?

Mr. Hart:

We will have those calculations available.

Q. Now, there is no rule of the Railroad Commission is there that has been promulgated which provides in determining whether or not you will grant a permit that you will take eight times the area of that particular lease upon which the permit is applied for?

A. I believe that is a policy that the Commission worked out to try to—

Q. It is not a rule or order of the Railroad Commission?

A. It is more of a policy, I think, more than it is any rule, but everybody is familiar with it and they can appear before the Commission to give such testimony as Mr. Rowan did.

Q. Now, Mr. Cottingham, you have determined the maximum amount of oil that is allocated on a potential basis for that field is approximately 7,000 barrels?

A. What is that?

Q. You stated, I believe, that the maximum amount of daily allowable that is allocated on the potential basis or potential order that you now use was 7,000 barrels. That is right, you stated that this morning, didn't you, or did I misunderstand you?

A. On what basis.

The Court:

I don't understand your question.

Mr. Tilley:

Your Honor, I asked him this question—

473 The Court:

Restate it if you can.

Q. What is the amount of daily allowable that you allocate among the wells in the field, to those wells which are not given the marginal of twenty barrels a day?

A. Every well in the field is given twenty barrels.

The Court:

I asked him that myself and he said about 7,000 barrels.

The Witness:

The proratable oil, yes.

The Court:

That surplus you have that you can prorate among the bigger wells. What about it now?

Mr. Tilley:

I just wanted to be sure that he had brought it out and that was the testimony. That is all.

(Witness excused.)

(At this time a recess was taken in this case until 9:30 o'clock a. m. of the following day, February 9, 1939, at which time the following proceedings were had:)

**Vol. II**  
**TRANSCRIPT OF RECORD**

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**Supreme Court of the United States**

**OCTOBER TERM, 1939**

**No. 681**

**RAILROAD COMMISSION OF TEXAS ET AL.,  
&  
PETITIONERS,**

**vs.**

**ROWAN & NICOLS OIL COMPANY**

**ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT  
OF APPEALS FOR THE FIFTH CIRCUIT**

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**PETITION FOR CERTIORARI FILED JANUARY 29, 1940.**

**CERTIORARI GRANTED MARCH 11, 1940.**



474 J. S. HUDNALL, a witness for the Respondent,  
having been first duly sworn, testified as follows:

Direct Examination.

Questions by Mr. Hart:

Q. State your name, please, sir.

A. J. S. Hudnall.

Q. Mr. Hudnall, where do you live?

A. Tyler, Texas.

Q. What is your profession or occupation?

A. I am a petroleum geologist.

Q. Mr. Hudnall, what education did you receive to prepare you for that profession?

A. I graduated from the University of Kentucky with a Bachelor of Science degree, had one year's post-graduate work at the School of Mines, Pennsylvania State College and one year's post-graduate work at the University of Chicago. I majored in geology and engineering at all schools.

Q. After you received that schooling state what practical training you had along that line.

A. I started out as an assistant geologist for Kentucky Surveys, which was doing more or less conservation work. My particular duties were to make a structural map of some of the oil fields producing in Kentucky. I worked for that survey about three and a half or four years.

475 Following that I did work for independent operators for about a year. Following that time I went into consulting work and have been doing it continuously ever since then.

Q. In what localities or oil fields have you worked?

A. I have been working during the last fifteen years mostly in Texas, but to some extent in New Mexico, Oklahoma, Arkansas and Louisiana, and occasionally off in some other states in wildcat consulting work, that is, exploration consulting work.

Q. How long have you been located at Tyler, Mr. Hudnall?

A. Since January, 1931.

Q. About what date did the East Texas Oil Field come in?

A. About October 10, 1930. There were about eight or ten wells in the field when I went there.

Q. Have you kept up with the conditions in the East Texas Field since that time?

A. Yes, sir. I have spent some eighty to ninety per cent of my time since that time studying the East Texas Field and keeping up with the developments there.

Q. And will you state to the Court generally, please, what you have done in order to inform yourself about the conditions in the East Texas Field, or what data you have consulted and so forth?

A. The first work that I did in the East Texas Field was to make a plane table survey, that is, a survey on top of the surface of the location of the wells and roads and school houses and all of the physical features on top of the ground. At this time elevations were drawn on some 4,000 wells and logs were collected from these wells and a structural map was made of the entire field. The  
476 first structural contour map was made about May, 1931. Following that I have worked up and revised the structural map essentially every six months to a year ever since that time.

Q. Well, does the picture of the structural map change as new wells are drilled and further information acquired?

A. Yes, sir, the map changes with new completion data. Almost every well on the west side of the field changes the contour some. There are so many wells now that the changes are minor in comparison to what they were back in 1933 and 1934 and 1935.

Q. Mr. Hudnall, have you ever been employed by the Railroad Commission of Texas in connection with work in the East Texas Field?

A. Yes, sir, I have been employed on a consulting basis on several occasions by the Railroad Commission.

Q. Were you ever consulted in connection with the application of the potential method of allocation?

A. Yes, sir, I was asked by the Commission and employed by the Commission to come down at the state-wide hearing prior to the institution of the potential method of allocation, to give my ideas as to how to take potentials and what they would reflect and how they would affect the various operators and various wells in the field.

Q. Are you familiar, then, with the geological facts in connection with the East Texas Field?

A. Yes, sir, I think I am.

Q. Would you state to the Court generally whether the Woodbine section in the East Texas Field is regular or irregular in characteristics throughout the  
477 field?

A. It is uniformly irregular.

Q. Explain that, please, sir.

A. I mean that throughout the field there is everywhere irregularity. The amount of these irregularities vary considerably from place to place, but there is no place where they are uniform.

Q. I will ask you to look at this map which has been marked Exhibit 35. Is that a structural map that was prepared by you, Mr. Hudnall?

A. Yes, sir, it is.

Q. Would you step over here, please, sir. Does that structural map indicate the contour lines on top of the Woodbine sand as near as you have been able to place those lines from the data which were available to you?

A. Yes, sir, it does, considering the interval that was used in contouring; this contour interval is only twenty feet. I have a larger scale map that reduces it down to ten feet, and that map is a little more accurate than this map, but this map is accurate for a 2,000 foot scale map.

Q. Is the top of the Woodbine section regular or irregular?

A. It is highly irregular.

The Court:

Counsel, is there anything to be gained by cumulating this evidence? If it is disputed, of course, then I will let you put it on, put on your evidence to sustain your position, but when you get on matters that have been testified to before and nobody is controverting them, what is the use of cumulating them?

478 Mr. Hart:

On this particular point, if the Court please, I understood Mr. Buck to say that the formation was regular and that is the reason I offered it.

The Court:

You may be right and I may be wrong.

Mr. Hart:

I understood him to say it was sufficiently uniform--

The Court:

I understood him to testify one place it was higher and one place lower.

Mr. Hart:

All right, sir, I will pass on from that.

The Court:

That, in the last analysis, is about all you are trying to do, isn't it?

Mr. Hart:

The irregularities in the sand?

The Court:

Yes.

Mr. Hart:

Yes, sir.

The Court:

Don't cumulate this evidence.

Q. Mr. Hudnall, have you prepared a map which shows the conditions in the East Texas Field with reference to the location of the marginal wells and abandoned wells, the pumping wells, wells making water, and other information in connection with the field?

A. I have.

Q. Is that this map?

A. Yes, sir.

Q. Now, Mr. Hudnall, that map will be identified as Exhibit 40. Mr. Hudnall, will you explain to the Court, please, what the various points on that map show, what they are intended to show?

A. The heavy black line represents the border of the field.

479

Mr. Moody:

The water or border?

A. Border, b-o-r-d-e-r, the periphery. The large circles about the size of a quarter on the outside of the black line are dry holes that have been drilled outside of the producing area. The large circles of similar size, but colored in orange, are dry holes that have been drilled on the inside of the field. These dry holes represent areas in which either the sand completely pinched out, or areas in which the drainage area of the well at that locality was so restricted that they would not produce in commercial rate due to the tightness of the sand, low porosity and low permeability.

Q. Mr. Hudnall, before you leave that, do you or not find within a ten acre area around those dry holes which were drilled within the field producing wells?

A. Yes, sir, there are in numerous cases offsetting wells that are flowing to these dry holes that were drilled that were within less than ten acres drainage area of the dry hole.

Q. Is that shown on the map that you have prepared there?

A. Yes, sir, all of the producing wells in the field are shown, all shown on the map by small dots, and the position of those wells is correctly shown. Also the position of the dry holes are correctly shown, and it will be observed by close observation of the location of these wells that there are numerous of them within less than 660 feet of those dry holes.

Q. As you have drawn the map, the map which was—the wells which are in the center of those circles are the dry holes and other wells within that circle are producing wells?

A. That is correct.

Q. And do you find numerous instances on 480 there where you find producing wells within a circle close to dry holes and within the area of the field?

A. Yes, sir, numerous areas.

Q. What does that indicate, if anything, with reference to the irregularities of the sand within the field itself?

A. It shows that the permeability of the sand is so low or the sand is so low that the dry holes would not produce at commercial rates. That is, the drainage area of those dry holes was so restricted it would not reach out to producing sands within 300 or 400 yards of those holes.

Q. Well, would they drain?

A. No, sir; they would drain some oil, but not in commercial rates, so the wells were abandoned due to that.



Q. Could the oil be recovered, then, by drilling just one well to ten acres?

A. No, sir.

Q. Now, what other marks do you have on there aside from the dry holes?

A. The smaller red circles are wells that were once commercial oil wells that have been abandoned since then. That is, they have produced their recoverable and have reached the end of their life and have been abandoned. The size of that red circle as exhibited on the map is such that the radius of the circle is the diagonal of a ten acre drainage pattern. That is, it represents the distance from the well that would be located in the center of a ten acre area to the diagonal corner of a ten acre tract and would be the area which a well would have to  
481 drain if it did drain all of the recoverable oil from a ten acre area.

Q. Now, in all of that surface adjacent to wells that have been plugged or abandoned do you find wells still producing?

A. Yes, sir, I find numerous cases where as many as three to seven producing wells, within this ten acre drainage area of the wells that have already ceased to produce.

Q. What would those facts indicate about the nature of the Woodbine sand in the vicinity of those wells?

A. They show without question that those oil wells did not drain all of the recoverable oil within a ten acre area of the well.

Q. Would it indicate anything as to the characteristics of the Woodbine section in that vicinity?

A. Yes, sir, it would indicate definitely that those characteristics are highly variable.

Q. Where do you find the plugged and abandoned wells with reference to the center or outside of the field?

A. They are usually on the periphery of the field, though in a few cases there are some that are as much as two miles inside.

Q. Do you find the abandoned wells on the east side of the field as well as on the west side?

A. Yes, sir, there is a large area of abandoned wells on the south end of the field, in the southeast of London, in Joinerville, the Joinerville area. These wells are located in areas where the sand had a very low permeability and a very low pressure condition exists. The drainage area of some of these wells was restricted to less than two acres.

Q. Well, now, how—what do you mean by that and how do you show that?

482 A. There are some wells still producing that are within 300 feet of the wells that are plugged and abandoned, and it is obvious that if the wells that are plugged and abandoned had not recovered all the oil that was within a two acre drainage area of the well they would still be producing.

Q. Is that or not on the highest part of the structure?

A. Yes, sir, that is the highest part of the structure.

Q. Do you find plugged and abandoned wells all along the eastern edge or lower edge of the structure?

A. Yes, sir, there are numerous plugged or abandoned wells along the eastern side. Some of them as much as two miles inside the eastern limit.

Q. Are some wells east of those abandoned wells producing?

A. Yes, sir, some of those east of abandoned, these abandoned wells, are still producing.

Q. What does the fact that those abandoned wells along the eastern edge of the field indicate with reference to whether or not the east edge of the field will go out of production before the center of the field?

A. They clearly show that the eastern side of the field is being abandoned before the middle of the field is, and they indicate very clearly that abandonment will advance from east to west, toward the middle of the field.

Q. Now, what with reference to the plugged and abandoned wells on the west side of the field can you say with

reference to the tendency that it shows, whether or not the abandonments will begin at the west and go towards the center of the field?

483 A. Well, most of the abandonments on the west side are on the extreme west side with the exception of local areas, like in the Gladewater townsite, which is reasonably close to the west side, and as you go eastward the number of abandonments decreases, so that undoubtedly the last area to be abandoned, moving eastward, will be somewhere near the middle or maybe slightly west or slight east of the middle.

Q. Do you find areas west of the Gladewater area which are still producing oil?

A. Yes, sir, there are numerous wells within a quarter of a mile of the Gladewater townsite that are still flowing and still producing at commercial rates, while inside of the townsite there are some forty wells that have been plugged and abandoned. The large map, the inset in the northwest corner of the exhibit, shows in detail the Gladewater townsite area. The red circles shown here likewise are constructed so that the area inside of the red circle is the drainage area of the well.

Q. Would the fact that wells still farther west from abandoned and plugged wells are producing oil, would that indicate anything as to whether there are lenses or other conditions in the structure which would indicate that the oil would be lost if those wells to the west had not been drilled and had not produced the oil?

A. Yes, definitely separated from the Gladewater area, separated by shale or volcanic ash, the part that lies west of it, that oil would have been lost, and the water did not migrate horizontally, it was very largely vertical in movement of the water, and that caused the  
484 final abandonment of those wells.

Q. You are speaking of the particular condition that existed in the vicinity of Gladewater?

A. Yes, sir.

Q. And that Gladewater area is west of the Rowan & Nichols property?

A. Yes, sir, almost due west.

Q. What else is shown on your map besides dry holes and abandoned wells?

A. The small lavender or purple dots are sub-marginal wells. The size of the dot is likewise the size of the drainage area of the well, if it drained a complete ten acre area.

Q. By sub-marginal wells you mean what?

A. They are wells that will not make twenty barrels per day, producing at their capacity, at the present time.

Q. Do you find the sub-marginal wells on the east side as well as on the west side?

A. Yes, sir, there are probably more—there are undoubtedly more sub-marginal wells along the east side of the field from Kilgore south than from any other part of the field.

Q. Is that the highest part of the structure?

A. Yes, it is.

Q. Do you find sub-marginal wells on the east side of the field as you go farther north?

A. There are not so many sub-marginal wells. There are a few sub-marginal wells scattered entirely along the east side, but the area immediately east of the Rowan & Nichols lease has fewer dry holes—I mean fewer abandoned wells and fewer sub-marginal wells than does most of the area along the east side.

Q. Within the ten acre (radius or ten acre  
485 area around the sub-marginal wells do you find wells which are not sub-marginal which are flowing or pumping more oil than a sub-marginal well would make?

A. Yes, sir, there are some wells offsetting the sub-marginal wells which are flowing. The flowing wells would undoubtedly produce 300 or 400 barrels or more while the sub-marginal wells won't produce more than from five to eighteen or nineteen.

Q. Does that indicate anything with reference to whether or not one well on ten acres would drain all of the oil within that particular vicinity?

A. It shows without question that they will not, a well that only produces from five to eighteen barrels a day producing at capacity cannot be draining very far from the well bore.

Q. Does it show anything with reference to the regularity or irregularity of the Woodbine section in that area?

A. It shows definitely that the Woodbine section is very irregular.

Q. Now, what other things are shown by that map, Mr. Hudnall?

A. The light yellow color represents the areas in which all of the wells are pumping wells and not making water.

Q. Generally with reference to which edge of the field you find the pumping wells, do you find the pumping wells which are not making water?

A. By far the majority of them are on the south end of the field, on the east side.

Q. Is that or not the highest part of the structure?

A. Yes, sir, it is, and it is in that portion of the field where there is tight sand and a shaly sand and consequently a low pressure area.

Q. Does that or not indicate to you that the east side of the field will go out of production before the center of the field?

A. Yes, sir, without any question. Generally speaking the abandonment will follow by increasing the area around the wells that have already been abandoned and the area around the wells that are sub-marginal and then out to the area that is now inside of the yellow line on the east side.

Q. Do you find pumping areas where water is not being made by the wells at any point on the west side of the field?

A. Yes, sir, there are numerous places along the west side of the field where although the pressure is 1,180 to 1,200 pounds per square inch and the wells do not make water, still they are pumping wells.

Q. Explain how that can occur.

A. That is brought about by the presence of volcanic ash and shaly partings in the sand grains themselves. The Woodbine formation was laid down at a time when there was considerable volcanic eruption taking place on the face of the earth. This volcanic ash settled in the Woodbine section and the ash settled between the sand grains and greatly retarded the permeability of that formation.

Q. Then would you indicate, please, sir, what the green area on your map shows?

A. The green area is the area where the wells are making water. There are a number of pumping wells inside of the green area, but they obviously  
437 could not be colored both yellow and green, so they are not shown individually, but I would say fifty per cent of all of the wells that are inside of the green area are likewise pumping wells as well as wells making water.

Q. Do you find wells which are producing without water west of the—west of other wells which are making a considerable amount of water?

A. Yes, sir, there are numerous places along the field where the extreme westernmost wells are clear of water production while to the east there are a number of wells that are making water and some dry holes. In other cases wells that have been plugged and abandoned—

Q. Does that indicate with reference to whether the encroachment of the water has been regular or irregular?

A. It shows definitely that the encroachment has been very irregular.

Q. Does that indicate anything with reference to the nature of the structure?



A. Yes, sir, it shows definitely that the structure is partitioned off by the shale partings and impervious material and material of low permeability.

Q. Now, because of the conditions that you have delineated there on your map, shown graphically, Mr. Hudnall, would you or not say that by permitting a drilling to a density of one well to less than ten acres the Railroad Commission has prevented waste and has caused a greater ultimate recovery of oil from the East Texas Field?

488 Mr. Moody:

May it please the Court, I object to that. It is a collateral attack upon the Railroad Commission's findings. It is an attempt to show that the more oil, the more wells you drill the more oil you will get, and it is immaterial and irrelevant whether the Railroad Commission has done wisely or unwisely, acted wisely or unwisely in allowing wells to be drilled on short locations.

Mr. Pollard:

If the Court please, we will be able to show that there have been specific findings by the Commission in its rules after the State-wide hearings at which evidence was admitted by the various persons that appeared before them to show that there would be more oil recovered from more wells that were drilled. It is in conformity with the spacing rule rather than opposed to it.

Mr. Moody:

All right, suppose that is true, I don't see what that has to do with whether the Commission acted wisely or unwisely.

The Court:

This is an expert. It is not necessarily binding upon the Court for the expert to testify as to his opinion, no harm can come out of it.

Mr. Moody:

No, sir, but that is a subject on which you can get these engineers to talk for hours. I know Your Honor isn't going to permit them to do it, but it just presents a proposition in the case that doesn't bear on the issues involved.

The Court:

I don't want to put any false issue in here that would require you to put a lot of testimony in to offset it, but I don't see any harm in letting him express his opinion.

489 Mr. Moody:

Note the exception.

The Court:

Go ahead, overrule the objection.

Mr. Moody:

Note the exception.

A. In my opinion the drilling of additional wells to a density of less than ten acres to the well will increase the ultimate recovery of the field by several hundred million barrels.

Q. Does a system of allocation which would encourage the drilling of wells—in other words, a system of allocation which is based on the wells or by potential per well, as the present method, does that or not tend to prevent waste and increase the ultimate recovery of oil from the East Texas Field?

Mr. Moody:

Pardon me, May I ask the Reporter to read that question? (Question read.) I object to that as being immaterial and irrelevant.

The Court:

I overrule the objection.

Mr. Moody:

Note the exception.

Q. Answer the question, please.

A. I think that it definitely tends to increase recovery of oil from the field and thereby decrease waste.

Q. Now, Mr. Hudnall, we will pass to the question of a marginal allowance or a minimum below which wells cannot be restricted provided they can make that minimum amount. In your opinion, is there any necessity for the prevention of waste for fixing a minimum below which wells cannot be restricted, provided they can make the amount of the minimum?

A. Yes, sir, very definitely.

Q. Now, would you explain that to the Court, please, why there is a necessity for a marginal allowance to wells?

A. There are numerous wells that have been  
490 drilled around the margin of the field that would never have been drilled if they had not had as much as twenty barrels minimum allowable, because you cannot go around on the edge of the field and explore for oil and drill the dry holes that have been drilled around the edge of that field to define it and depend upon less than twenty barrels per day to get your returns back.

Q. Would the oil that they have produced be produced by other wells if those wells had not been drilled?

A. Some part of it would have been produced by other wells, but a very large percentage of it would never have been produced.

Q. Does the drilling of those wells increase the ultimate recovery from the East Texas Field and prevent waste?

A. Yes, sir, they have caused the development around the field to extend, that is, around the extreme margin of the field where there is only five to ten feet of sand, they have caused that area to increase by an amount of acreage from about 125 acres back in 1934 and 1935, up to about 138,000 acres at the present time.

Q. You have pointed to the western edge of the field. Does that same line of reasoning apply to the eastern edge of the field?

A. Yes, sir, there have been numerous wells drilled extending the eastern edge of the field for the same reason. Back in 1934 and 1935 the eastern limit line as depicted by the geologists of that time was essentially a straight line. By the drilling of these wells on the edge of the field small outsets and insets in the field have brought about this irregular outline of the eastern limit of the field at the present time.

Q. Has the drilling of those wells, which  
491 would not have been drilled except for this marginal allowance, caused more oil to be recovered in the East Texas Field than would otherwise have been recovered?

A. Yes, sir I think so, unquestionably.

Q. Now, you have spoken of the influence of the marginal allowance on the ultimate extension of the field and additional recovery. Now, with respect to marginal wells or wells which are becoming marginal wells, would you state whether or not a minimum allowance for those wells is necessary to prevent waste?

A. Yes, sir, if the wells are restricted very much below ten barrels per well a day there would be numerous abandonments due to the expense of operating the wells. On the west side of the field where the wells are making, some of them, from seventy to ninety-five

per cent water, when the daily production declines to below ten barrels they are plugged and abandoned.

Q. Now, what is the condition on the east side of the field and how does the marginal allowance affect the wells on the east side of the field?

A. There is likewise plugging and abandonment of wells on the east side of the field due to paraffin troubles; as the daily production from the well becomes less and less the paraffin trouble increases. That is, the oil coagulates in the tubing and prevents the well from pumping and requires considerable expense to clean this paraffin from the tubing. Sometimes it has to be done once a month and sometimes once every two weeks and some wells if they are producing a little more

492 than twenty barrels, that are yet pumping, will continue for three months without cleaning of the paraffin, but the paraffin problem is a very big problem on the east edge of the field. On the south side numerous wells are being plugged over there when they get down to five or ten barrels a day, but ordinarily five barrels would be the approximate economic limit.

The Court:

What is the price of oil?

A. \$1.10 a barrel at the present time.

Q. Of course, a raise in the price would cause you to vary your estimate as to what the marginal allowance would be and the wells still operate?

A. Yes, sir. If the price of oil should go down to ten cents a barrel there would be dozens of wells that would be abandoned immediately, but if the price stays up they will continue to produce.

Q. What would be the result of premature abandonment of wells throughout the field upon causing waste?

A. A very large per cent of the oil that they would produce had they not been plugged and abandoned will be lost and irretrievably recovered.

Q. You mean it will not be recovered?

A. That is right.

Q. Now, do you know approximately how many wells have been drilled since the present proration order was adopted by the Commission in April of 1933?

A. There have been about 17,000 wells drilled.

Q. Do you know how many of those wells would have to be prematurely abandoned if their marginal allowance was stricken down?

A. Well, there would be literally hundreds  
493 If you place no margin or put no top allowable on the field and let the field run unrestricted.

Q. Suppose you kept the top allowable but knocked out the marginal allowance, would there or not be numerous wells stricken out and oil irretrievably lost which otherwise the oil would be recovered under the present plan?

A. Of course, you have to have a limit on that lower limit. If you restrict them for any reason below five or ten barrels a day, regardless of what the reason is, there are going to be numerous wells abandoned.

Q. Is the present marginal allowance of twenty barrels a day, which when considered with the Saturday and Sunday shutdown amounts to an average of about fourteen barrels a day, is that in your opinion a reasonable marginal allowance for wells in the East Texas Field?

Mr. Moody:

If the Court please, that is immaterial and irrelevant.

The Court:

I think you are asking him to pass on the ultimate question that the Court will have to pass on, in the form you put it.

Mr. Hart:

I will change the form of it.



The Court:

● looks like you are asking a witness if somebody is guilty of negligence.

Mr. Hart:

I will change that.

Q. With reference to the prevention of waste, is a marginal allowance which averages approximately fourteen barrels per day, does that have a reasonable relation to the prevention of waste, in your opinion?

A. I think it does.

494 Q. Just explain that, please, sir.

A. Fourteen barrels a day is about the minimum at which they will drill and produce oil. You can produce it on a lease for less than that, but you can't go out and drill a well on very much less than that.

Q. Mr. Hudnall, have you made a tabulation of the number of abandoned wells in the East Texas Field within the last three or four years?

A. Ye., sir, I have a sheet tabulating the periods at which these wells were abandoned.

Q. Do you have more than one copy of that?

A. Yes, sir, I have two copies.

Q. Mr. Hudnall, what does that show with reference to the abandonment of wells within the last four years in the East Texas Field?

A. It shows that during the year 1932 there was one abandoned producing well; in 1933 there were four; in 1934 there were seven; in 1935 there were five. Beginning at this point the abandonments increased very materially. In 1936 there were twenty-four; in 1937 there were seventy-six; in 1938 there were 207, and during the month of January, 1939, there were about thirty, twenty-five to thirty.

Q. Now, in the history of the field, the natural history of the field, were those abandonments to be ex-

pected, according to geological data and experience in similar oil fields?

495 A. Yes, sir, they represent the weakling wells, that is, the weakest wells, and they are the natural occurrence in the history of any oil field.

Q. Have you compared the rate of abandonments with the rate of drilling of new wells in the East Texas Field so that you could state whether or not the rate of abandonment will in the future probably exceed the rate of drilling of new wells?

A. Yes, sir, I have made some calculations on that feature.

Q. Would you state in general what your conclusions along that line are?

A. The rate of development in the field has declined very materially during the past two years. The decline in this development rate is by years approximately as follows: In the year 1931 there were approximately 3,620 wells drilled and completed producing; 1932, 5,732; 1933, 2,476, the big decline in this year being due to the low price of oil; 1934, 3,686; 1936, 4,038. From this period it begins to decline to the end, up to the present time. In 1937, 2,458. I believe that those figures, I made, a year behind in those. The year 1934, 3,686; the year 1935, 4,038; the year 1936, 2,458; 1937, 2,351; 1938, 1,771, and during January, 1939, approximately 91 or 92 wells, that is, at the present time that are being completed at a rate of about half what they were a year ago. Projecting this rate of decline in development into the future indicates that during the year 1939 there will be about 1,000 wells drilled, and the year 1940 some 500 to 700, and 1941 a few hundred, and that, according to this decline, would be the approximate total number of wells in the field. However, that will of course be affected by the price of oil and numerous other things.

Q. Well, now, if that trend is carried out will  
 496 the number of abandonments exceed the number of new wells completed and therefore there will be fewer wells among which to divide the allowable production in the East Texas Field?

A. Yes, sir, undoubtedly the rate of abandonment will catch up with the rate of completions in a couple of years at that rate.

Q. Which part—

A. And thereafter the rate of abandonments will materially increase over and above new completions.

Q. Which part of the field will go out of production last, Mr. Hudnall? Will the area around the Rowan & Nichols lease go out soon, or will it be among the last areas in the field to go out of production?

A. In my judgment, it will be among the last areas. I think if you took an area or radius of one mile from this lease, that somewhere within that mile you would have the approximate last part of the field to produce.

Q. If you now gave them an allocation which ignored the fact that they would produce longer than other areas in the field, would their ultimate recovery be greater or not than their recoverable reserve?

A. Well, if you gave them an allocation that was in proportion to the oil that is in that area as compared with the total oil in the field they undoubtedly would under that method ultimately produce more oil than originally was under their tract that was recoverable, because they would be producing—say they owned, to illustrate it,

one per cent of the reserve. Now, if they get  
 497 one per cent of the allowable but get that for twice as long a period they obviously would get out with twice as much oil.

Q. Now, Mr. Hudnall, you have spoken of the irregular characteristics of the field and the way in which it varies, and I will try not to duplicate the testimony along that line, but I would like to ask you this: There

has been some testimony about Schlumbergers and other information which has been recently acquired. Does that information which has been acquired by Schlumbergers and others make it easy to calculate mathematically the reserves under a tract of land, or does it make it more systematic?

A. I think it emphasizes the reserves under a tract, but it gives you information on which you could make some estimation.

Q. Tell us what the Schlumberger shows and the limitations of the Schlumberger.

A. In the East Texas Field there are some leases where the acreage of the lease, say, is sixty-five acres. I have in mind one lease where there is sixty-five acres. It is located out pretty well in the fairway. I have Schlumberger records on nine wells on this sixty-five acre lease. There are no two of these wells that have the same percentage of Woodbine that is saturated with oil sand. The variation on this sixty-five acre lease amounts to seventy to eighty per cent. The wells with the lowest percentage of the formation, that is, saturated oil sand, will run around forty-five per cent of the total thickness, and the well that has the highest will run around eighty per cent, so one of them is at least fifty to seventy per cent higher. Although the sand thickness

498 is the same, the oil content in the sand, due to this variation in the percentage of the sand, will vary fifty to seventy per cent. Then in addition to that the porosity would undoubtedly vary fully that much, and the Schlumberger records show without any question that the irregularities exist locally, they are not general conditions that can be interpreted from one well to the next because they vary in each well.

Q. Aside from the cost of making Schlumberger tests on the 25,000 or more wells in the East Texas Field, what difficulty do you have practically in making Schlumberger tests on completed wells?

A. In order to make a Schlumberger test the well must have the casing removed in the zone that is being tested, or the liner. In the case of most of the wells in the East Texas Field there is a liner extending from the bottom of the casing down to the bottom of the hole.

Q. What do you mean by a liner, Mr. Hudnall?

A. That is a perforated piece of casing that goes down below the cemented casing and it is simply dropped in the well, sometimes it is cemented, but usually not. The purpose of it is to keep back the shale and volcanic ash and the sluffy material from covering up the oil sand, and where there are liners in the wells you cannot make a Schlumberger test. The liners could be pulled out on most of the wells, probably two-thirds of them, or three-fourths of them, but the expense of pulling the liner and making the Schlumberger test would be very great.

Q. What about cases of the wells where the casing goes all the way down and they have shot the casing, could you take a Schlumberger on those wells?

A. In most of the wells where the casing is run down into the sand and the casing is perforated Schlumbergers were run before the casing was extended into the sand.

Q. Of course, a Schlumberger would show the sand only as far as the well had been drilled into the sand, is that correct?

A. Yes, sir, it would only give you the sand section to the extent of the penetration of the well into the sand.

Q. Now, Mr. Hudnall, I will ask you to state whether in your opinion the potential tests indicate or reflect to any degree the factors which go into the productive capacity of a well, and state what factors, if any, that potential test, that potential would show, and what factors it would not show, if there are any?

A. The potential of an oil well in the East Texas Field in my opinion reflects porosity, permeability, sand

thickness, that is, saturated sand thickness, structural position to some extent, connate water, and to some extent the percentage of the pore space that carries oil.

Q. Are those all of the factors that go into a consideration of the productive capacity of a well?

A. All of those factors definitely enter into determining what a well will produce.

Q. Do you have a more accurate picture of the way those factors actually work in combination by making a potential test than by sitting down and trying to figure out mathematically what the recoverable reserves under a tract or within the drainage area of a well would be?

A. I think the testing of the well and seeing what it will actually produce is one of the best indices of its future production that there is. It has been my experience in appraising millions of dollars worth of property in the East Texas Field that the best method is to test the wells as well as get the other data, and it has been my experience to test more than 2,000 wells in the field for this purpose.

Q. Mr. Hudnall, does the potential indicate the amount of recoverable reserves within the drainage area of the well?

A. I think it indicates it.

Q. Of course, it does not indicate the surface acreage of the lease upon which the well is located, does it?

A. No, sir, the drainage area of an oil well doesn't pay much attention to surface acreage. There is very little relationship between surface acreage and drainage area.

Q. If a man feels his property is being confiscated by drainage is there a rule of the Commission, aside from the proration order, which permits him to drill wells on his tract in order to protect himself?

Mr. Moody:

The rules themselves would be the best evidence.



The Court:

I think so. As I understand it, the case we have here is that the parties have been allowed five wells.

Mr. Hart:

Six wells, if the Court please.

The Court:

There is a wrangle as to that.

Mr. Hart:

The order shows the sixth well has been granted and no rehearing requested.

501 The Court:

How many more did they ask for?

Mr. Hart:

They asked for twenty wells, which would make twenty-five wells on the tract.

The Court:

You asked him if there is a rule that would enable them to get more wells. Of course, the rule would be the best evidence. And in the second place, what is the pertinency? How does it affect the situation?

Mr. Hart:

Our purpose is to show a man can protect himself.

The Court:

If a man is in jail it may be you can't keep him there, but you do. You say they can drill more wells, but the Commission refused him.

Mr. Hart:

We have shown, if the Court please, that they have been drilled to a greater density than the average of their surrounding area. Not greater than the Wood tract, but much greater density than the average of surrounding areas and the field as a whole.

The Court:

I sustain the objection. The rule would be the best evidence.

Mr. Tilley:

Your Honor, I want to correct something Mr. Hart said. I think Mr. Hart misstated the facts innocently. The permit was granted in a case where other permits were applied for alternatively, however, to our application for an adjustment in allowable under one case number. Then when that one permit was granted and the others and the adjustment of allowable denied, we filed for rehearing and they reopened the case.

502 Mr. Hart:

I think the best way to determine that would be to read the order. The order itself grants six and then grants a rehearing on wells seven to twenty-five, and as far as the granting of well No. 6, there has never been a rehearing granted on that, and so far as I know, no application for rehearing. The order is in evidence here.

The Court:

All right.

(Mr. Hart, counsel for defendant, then read the order in question, Exhibit 15.)

Mr. Hart:

Pass the witness:

(At this time a short recess was had, at the conclusion of which the following proceedings were had, to-wit:)

Cross Examination.

Questions by Mr. Moody:

Q. Mr. Hudnall, most of your testimony, I believe, has been related to that last map that was put up there, Exhibit 40?

A. Yes, sir, very largely.

Q. Now, that outside line, that black line that goes around that map, is intended to show the outside limit of the productive area in the East Texas Field, as I understand it?

A. That is correct, as they are indicated at the present time.

Q. Now, all of those wells that you have shown on that map as having been abandoned or as having come into water, as much of the map as I can see from here—let's see if I am not right. The red ones are abandoned wells and the purple are sub-marginal wells and the large orange circles represent dry holes?

A. That is correct.

Q. All right. Now, you haven't got any dry  
503 holes down through the center of the field, have you?

A. There is one about two miles in on the lower part of the field. It is not in the center, but within a half a mile of the center, just west of the town of London.

Q. Well, how far is that from the south end? I don't know where the town of London is.

A. Right here.

Q. That is in a water area, isn't it?

A. At the present time, yes.

Q. All right. Now, then, that is some twenty-five or thirty miles from the tract of land involved in this lawsuit, isn't it?

A. Yes, sir.

Q. All right. Now, then, Mr. Hudnall, how many acres or approximately how many acres are there inside your black line that borders the productive area of the field.

A. About 138,000 acres.

Q. About 138,000 acres?

A. Yes, sir.

Q. You haven't got your contour lines on here?

A. I have the contour line on which this lease is located.

Q. Suppose you take the twenty foot contour line that is not shown on that map, but it is shown on this one over here, isn't it?

A. Yes, sir.

Q. Suppose you run that twenty foot contour line around in there inside your black line, how many acres would you have inside your twenty foot contour line, approximately?

A. I would estimate it at around 10,000 to 15,000 acres.

Q. I am not talking about between the outside here.

A. Well, it is inside of the black line and outside of the twenty foot contour.

Q. I am talking about inside of the twenty foot contour line.

A. All of it except 15,000 or 20,000 acres. That would be rough.

Q. What?

A. That would be roughly 120,000 acres.

Q. 120,000 acres would be within that area enclosed in the twenty foot contour line, is that right?

A. That is approximately correct.

Q. That would mean about 123,000 acres of land inside of the twenty foot contour line?

A. Yes, sir.

Q. All right. Now, then, all the testimony that you have given here, or the major portion of it that you have given here, with respect to this map and what it shows with reference to dry holes and abandoned holes and sub-marginal wells, most of it has to do with that 15,000 acres that is between the outside limits of the field and the twenty foot contour line, isn't that right?

A. Well, probably you could say the most of it does. Of course, there is about a third of the wells that have been plugged and abandoned are on the east side of the field and about two-thirds of them on the west side.

Q. But over there where it has been abandoned, on the east side where they have been abandoned, with a few rare exceptions, you have less than twenty feet of sand there, haven't you?

A. Yes, with few exceptions.

Q. All right, and over on the west side, with  
505 a few rare exceptions, the wells that have gone to water and have been abandoned, you have less than twenty feet of sand thickness?

A. Well, in the Gladewater townsite you have forty wells—

Q. We will call that an exception. Let's leave that out for the time being. That is true, isn't it?

A. Well, with that exception and probably one or two other small areas.

Q. All right. Now, in the Gladewater townsite area, that territory is drilled to a great density, is it not?

A. In Gladewater?

Q. In the townsite?

A. About a well to two acres.

Q. About a well to two acres?

A. A little less than two acres to the well.

Q. And that is taking in the whole townsite?

A. That is correct, taking in about 500 acres.

Q. Now, then, you can draw that down and find for me in the Gladewater townsite instances in which the drilling density is as great as ten wells to an acre, can't you?

A. No, I don't believe you can find that in Gladewater.

Q. All right, five wells to the acre?

A. Pretty close to that.

Q. Pretty close to that. It is a densely drilled place now. Another thing, there was a time back there in the East Texas Field when they were producing a lot of hot oil, wasn't there?

A. Yes, sir.

Q. And the Gladewater townsite was one of the places where they were doing that?

A. Yes, sir, it was very notorious in that.

Q. All right. And the withdrawals from the Gladewater townsite were among the greatest in the entire field, isn't that true?

Mr. Hart:

We wish to object to any violations of the orders of the Railroad Commission. I don't see how that could be considered relevant and material to this case.

Mr. Moody:

That is not what I am getting at. I am trying to show that the abandoned wells in the Gladewater area is largely due to the intrusion of water brought about by the tremendous withdrawals of oil in that area, and that is the exception he said, and to show that particular exception that exists within the twenty foot contour line is explainable by that fact.

The Court:

Overrule the objection.



Q. Well, you have heard my statement to the Court. I have stated the facts about right, haven't I, what I am trying to prove? That is the truth, isn't it?

A. I think that is about the facts about it.

Q. So, the abandonment of these wells in the Glade-water townsite has been contributed to substantially, if it is not directly attributable to, the large withdrawals of oil there?

A. Yes, sir.

Q. All right, now, that is the one exception of any importance to abandonments within the enclosure of the twenty foot contour line?

A. Yes, sir, most of the others are outside.

Q. All right. Now, then, Mr. Hudnall, so if  
507 you get inside of the twenty foot contour line, that is, inside of the area where they have more than twenty feet of sand, why, the abandonment and the dry holes are not one in ten thousand, are they?

A. Well, I would have to make that calculation.

Q. Well, it is negligible?

A. They are relatively small.

Q. It is negligible, isn't it?

A. I don't think it is negligible for the purpose for which the data is submitted.

Q. By and large, taking the wells in that area, the number that have been abandoned and the number that are dry, it is a very small ratio, isn't it?

A. That is true.

Q. Now, over on the east side there where you have got some small wells that are shown to have been drilled in dry and some to be marginal wells and some to be—sub-marginal, I mean—that is right over where the sand pinches out, or is against the Sabine Uplift. I believe you call it, isn't it?

A. Yes, sir, it is over in that area. Of course, there are a number of flowing wells in between those and the eastern side.

Q. Mr. Hudnall, that pinching out over there is not a long and even line, is it?

A. No, it is rather irregular.

Q. In other words, that pinching out comes along like, I don't mean exactly like, but it waves in and out as your black line along the eastern edge of your map waves?

A. That is correct.

Q. Now, while you put your line, the black  
508 line here, we will say about halfway between Kilgore and Joinerville down here, now, you have your black line bending out here, in places you carry it out there by reason of the fact that you have a well over here somewhere that produces?

A. That is correct.

Q. Now, of course, you don't mean that the pinching out—you said it isn't long and even, but it is even more irregular than you can show it on that map, isn't it?

A. That is true.

Q. Because it will finger out here for 200 yards and maybe very narrow, some fellow may have luck enough to hit in that 200 yards, and down here it will finger out for 500 yards, some fellow may have been lucky enough to hit there, but whereas back from him to the right or left of that it may have already pinched out, so that a well drilled in there would be dry?

A. That is correct.

Q. And so when you show with these red dots—wait a minute—the green circles, when you show those green circles, the dry holes, it may be that one fellow over here in offset distance happened to drill into one of those fingers where the sand fingered out and another fellow got over here where there wasn't any fingering?

A. That is right.

Q. Now with reference to the abandonments in some places where you get right out to the edge with the sand fingering out, it is thin when it gets out there, is that right?

A. Yes, sir.

Q. And it is intermingled with more substance  
509 than the Woodbine sand and is not so good as  
back over here in the better part of the Wood-  
bine sand and the permeability is naturally better?

A. Yes, sir.

Q. So, where you have had these abandonments and  
dry holes, that is not typical of the East Texas Field,  
the man out there is hanging on by his eyebrows, isn't  
that true?

A. It is the same condition the rest of it will be in  
in five years or ten years or twenty years. It will all  
come in as the field is abandoned.

Q. Where you have twenty feet of sand, of permeable  
sand, along the east edge of the oil field over there, that  
is not going to be dry in five years from now, is it, or  
ten either, at the present rates of production?

A. No, if he has five feet of good oil sand and perme-  
able that will not be dry in five years, from the east  
side west.

Q. All right. Now, let me ask you this question:  
If you would consult the logs of those wells that have  
been abandoned you would expect to find the most of  
them having very little sand, wouldn't you?

A. Yes, sir, that is true.

Q. And if you could see the core of them you would  
expect to find those cores out there at that edge and  
in that thin sand just in such a condition that it was  
a problem of nature whether this was going to be Wood-  
bine sand or something else, Georgetown lime or some  
other sort of formation between, just weaving in to-  
gether as nature laid them down in some geological age,  
isn't that right?

A. That is true, but it is largely Woodbine.  
510 It isn't a question of whether it is Woodbine or  
something else, it is Woodbine, but very little  
saturation in it.

Q. Now, then, Mr. Hudnall, you testified, as I understood you, that a per well plan of proration you thought was good, or one of its virtues was that it would lead to the drilling of wells and finding of oil?

A. Yes, sir, I think that is the best virtue, or one of the best, that it has, from the viewpoint of physical waste.

Q. Isn't this the reason it has that virtue, that it encourages a man to drill a well because he knows if he gets a poor well that he will get just as good an allowable as a man that has a big well?

A. Well, that is partly it. He knows that if he drills a well that he is going to produce enough oil from it under the present regulations, in a good area, to make money on it.

Q. In other words, if a man has a tract of land out there and he knows he hasn't got but ten feet of sand in it, or twenty feet of sand, and that he will not have a very good well, but figuring on twenty barrels of oil a day at \$1.10 a day, that will pay out in just about two years' time, or very little over that, and he is on a per well basis, and another man has a well that will produce 1,000 barrels of oil a day and his will maybe produce only forty or fifty barrels a day, he knows that in drilling on that land he will get just as good an allowable as the fellow that has a very much better well?

A. Yes, that is approximately right.

The Court:

This witness never has testified that this order was on a per well basis. I think Mr. Cottingham said that.

511 Mr. Moody:

All right, I will get to that. Just one or two questions along this line and then I will get to that.

Q. Now, then, Mr. Hudnall, if the field is on a per well basis and a man has half an acre of land and the Railroad Commission will let him drill on it on a per well basis, that man is encouraged to drill, is he not, because he knows that he has fifteen or twenty feet of sand and that he will get on his half acre, his well on his half acre, just as much oil as the man who has ten acres of land or five acres of land and only one oil well on it, and a very much more productive sand under his five acres?

A. Yes.

Q. And that is what you mean when you say it encourages drilling, the per well basis?

A. Well, yes, that is part of it, that is a very large part of it.

Q. Now, Mr. Hudnall, we will take this order that is under attack in this lawsuit. You are familiar with it, are you not?

A. Yes, sir.

Q. In its practical application, whatever it may say, as it is applied and enforced on the East Texas Field, I will ask you if this isn't the result, that each well in the field that will make twenty barrels is allowed twenty barrels?

A. Yes, sir.

Q. All right, then that number of wells which cannot make twenty barrels per day are allowed to make as much as they can, and the amount by which in the total they lack of making twenty barrels is then  
512 divided up amongst those wells having a potential of over 860 barrels per hour and therefore can make more than twenty barrels? Is that question clear?

A. Yes, sir, that is clear.

Q. All right, that is the practical workings of this order in the East Texas Field?

A. Yes, sir.

Q. All right. Now, then, as the result of the way this order is applied in the East Texas Field, there then remains only approximately 7,000 barrels of oil to prorate amongst wells on a potential factor, isn't that right?

A. That is correct.

Q. So, of the 522,591—is that figure correct? Let me have that figure. So, of the 522,591 barrels of oil allowed daily for this field under the Railroad Commission orders, only 7,000 barrels of that, or approximately 7,000, is allocated amongst wells on a potential basis?

A. That is correct.

Q. That is the practical workings of it?

A. That is correct.

Q. That is less than 1.6 per cent of the daily field allowable, isn't it?

A. That is my information.

Q. Well, do you have your slide rule there?

A. I say I think that is correct.

Q. Right, so 98.4 of the daily allowable is allocated on a well basis and less than two per cent of it, or about 1.6 per cent, on a potential basis?

A. Yes, sir.

513 Q. All right. In your opinion isn't that practically a per well basis of prorating the allowable oil of that field?

A. As a practical statement that is true.

Q. As a practical statement it is a per well basis?

A. Yes, sir.

Q. All right, now, Mr. Hudnall, by the way, as a matter of fact, though the schedule here that has been introduced, Plaintiff's Exhibit No. 19, says that the scale of production here is 2.32 per cent of the hourly potential and purports to reflect an allocation amongst wells on a potential basis, in truth and in fact it is not a potential basis, is it?

A. Well, it is practically a per well basis.



Q. All right. Well, now, listen, here is what I am getting at, do you know what the total potential, hourly potential, of the entire field is?

A. Not exactly. I think it runs around 15,000,000 barrels.

Q. Well, my figures are 15,667,543 barrels of potential, hourly potential, is that about right?

A. I think that is substantially correct.

Q. All right, do you know what the hourly potential of the Rowan & Nichols lease is?

A. It is about 960 barrels.

Q. That is per well?

A. Yes.

Q. Well, all of them, the five of them, then, would be about 4,820?

A. Yes.

Q. Now, if you were going to allocate this oil on a potential basis you would then determine what per cent of 15,667,543 4,820 is and then give Rowan & Nichols that per cent of 522,591?

A. Yes, sir, on a strictly potential basis without any allowance.

Q. That wouldn't even figure out 2.32, will it?

A. I haven't made the calculation on it.

Q. All right, instead of figuring it that way let's state a problem in algebra, wouldn't it be this: The field allowable 522,591 is in proportion, and I will use the unknown factor, field allowable is to field potential as X, the allowable of this lease, is to this lease potential, namely 4,820?

A. Yes.

Q. That would be the correct proportional statement of it, wouldn't it?

A. Yes, if you consider all of the wells.

Q. All right.

A. As a basis for doing it rather than the acreage.

Q. Then, getting back into fractions, you would have 522,591 over 15,667,543 equals X over 4,820?

A. Yes, sir, 4,820.

Q. And that will figure out about 3.33 if you multiply out and determine the value of X?

A. I haven't made the calculation, but the solution of that problem will give you the answer.

Q. Now, I will ask you if this isn't the way the Railroad Commission is doing it, they are dividing—they are determining what per cent of 15,667,543 is of 522,591 and then using that per cent to multiply into the 4,820 and then taking five-sevenths of that, which will give you 232, and then by shutting down two days a week they give you five-sevenths of that, isn't that the way they are figuring it out?

A. I haven't gone through that formula, but I can state to you what I think the formula is and how it is arrived at. I think they allow twenty barrels in every well in the field—

Q. I am talking about how—

The Court:

Let's hear him give his idea. You have a problem here and it is good to hear everybody's views on it.

Mr. Moody:

I didn't understand you.

The Court:

You have a problem and it is good to hear everybody's views.

A. They take the total field top allowable of say 522,000 barrels, and they take the total number of wells and multiply it by twenty barrels apiece, then subtract that amount from the 522,000 barrels, that leaves the amount of oil that will be distributed on a potential basis, and that then is distributed among the wells on a potential basis. Now, that is the practical effect of it after

deducting the sub-marginal wells, which amounts to about 4,000 barrels a day.

Q. Mr. Hudnall, I don't follow—I am sorry, I didn't follow you in that. Would you mind stating that over, please, sir?

A. They start out with a top field allowable of 522,000 barrels per day. They also have a given number of wells, of close to 26,000 wells. They multiply this 26,000 wells by twenty barrels, which if they had exactly that many would be 520,000, but there is a few number less than that; so that the number, that number times  
 516 twenty subtracted from the total of 522,000 for the field top leaves a certain amount that is to be distributed on a potential basis.

Q. I see.

A. That is all there is to it in the practical effect. Now, there is 4,000 barrels of sub-marginal oil that would come off of this first deduction of 26,000 wells times twenty barrels.

The Court:

The potential is in there, it is a big word; but doesn't figure very much in the actual result, does it?

A. No, it doesn't figure but very little as a practical matter. In 1933 they started out and gave the wells fifteen per cent of their hourly potentials. Then as the number of wells increased that percentage decreased, so it was reduced from fifteen per cent to ten per cent, seven per cent to five per cent, and now it is down to 2.32, so that the percentage of the hourly potential factor has been decreased as the number of wells have been increased in order to hold it down to top allowable.

The Court:

Do you mind my taking your witness for a moment?

Mr. Moody:

No, sir, I am glad for you to have him.

The Court:

Have you made any study or given any consideration to this top allowable?

A. Yes, sir, I have given considerable study to it.

The Court:

Do you think that that is as high as it is safe to allow?

A. My own personal—

517 The Court:

From the standpoint of physical waste, or is it a question of the market demand in that allowable?

A. My own personal judgment is it can produce considerably more.

The Court:

Without hurting the field?

A. I think so, but the majority of engineers don't follow me on it, but I personally think it could do considerably more.

The Court:

All right.

Q. Now, Mr. Hudnall, you stated in answer to the Court's question that the potential factor didn't figure very much in it, or the Court asked you if that wasn't the case and you said yes. The potential is not exceeding two per cent, is not exceeding a two per cent factor, is it?

A. No, sir.

Q. In determining the allowable?

A. No, sir, it is not.

Q. In other words, when you said that you multiply 26,000 and some odd by twenty—

A. Yes, sir.

Q. And then you deduct that from the field allowable—

A. Yes, sir.

Q. That leaves you some 3,000 or 4,000 barrels?

A. Yes, sir.

Q. And then you add to that the 4,000 barrels that the sub-marginal wells will not make of the twenty barrels per well allowed to them?

A. Yes, sir.

Q. And that gives you the 7,000 which you say is all the oil that is prorated on a potential factor?

A. Yes, sir.

Q. Do you know where the Commission gets the 2.32 they publish in their proration schedule?

A. Yes, sir, that is the potential factor that they can apply.

Q. Wait just a minute, Mr. Hudnall, I am asking you if you know the formula of mathematics by which they arrive at that figure?

A. Yes.

Q. All right.

A. That is the percentage that can be applied to the number of wells that exist over and above the marginal allowance. That will give you the 7,000 barrels.

Q. Oh, they get that figure by first finding out how much oil there is left after this twenty barrel allowable?

A. Yes.

Q. And then they find out what proportion of the potential—of the allowable the 7,000 barrels is?

A. That is essentially correct. Now, they may arrive at it in some other very complicated way, but that is what it amounts to.

Q. I agree with you that is what it amounts to, the result is the same, but let me ask you if this isn't the way they arrive at it: They divide the total hourly potential of 15,667,543 into the daily allowable of 522,591 and get that figure and then take five-sevenths of that figure and arrive at their 2.32 and say that is the potential factor, and then later on, now, where they get that five-sevenths I don't know, and then later on they give another five-sevenths by allowing you to produce that amount five days out of seven, so in reality  
 519 don't they in fact do this, allow you daily to produce five-sevenths of five-sevenths of that per cent which the field allowable bears to the field potential and call it prorating on a potential basis?

A. Well, I can't tell you exactly how they go through it. I know what the effect is, but to tell you what mental stages they go through to arrive at that, I can't. I think though the five-sevenths is applied entirely after the other calculations are made. I don't think it enters into the original calculations at all.

Q. Well, as I divide 5,200—determine the per cent which 522,591 is of 15,667,543, I find that to be approximately 3.33, and five-sevenths of that I find to be approximately 2.32, and then they allow you to produce five days a week, which in effect amounts to giving you, as I figure it, five-sevenths of five-sevenths of that per cent that the field allowable is of the field potential, and prorate the excess oil on that basis?

A. Well, the sum total essence of it is to give every well twenty barr and whatever is left, what that total amount is between that and 522,000 is distributed among the other wells on the potential basis, considering the 4,000 barrels the sub-marginal wells fail to make.

Q. And for all practical operating purposes that is a per well basis?

A. Yes, sir.



Q. But you just don't know the formula or mathematical formula by which they work out their 2.32?

A. No, sir, except that I know it is so worked out when applied to all the wells that—

Q. Now, Mr. Hudnall—

Mr. Pollard:

I don't believe he has finished his answer.

Mr. Moody:

Pardon me.

A. That is the factor that when applied to all the wells in the field that have a potential of more than 860 barrels per hour will give you the 7,000 barrels of oil that is allocated on a potential basis.

Q. All right. Now, Mr. Hudnall, this schedule shows that every well—according to this proration schedule promulgated by the Commission and now in force in the East Texas Field, as I understand it, wells that will make—wells with a potential from one barrel per hour to wells with a potential as high as 860 barrels per hour are all allowed the same production?

A. That is correct.

Q. Now, then, do you know any reason why in order to prevent waste it is necessary to so allocate—to so promulgate and enforce this order, except just simply to hold the thing within the 522,000 barrels?

A. Well, I think that is the answer, if you are going to hold the field for a top allowable of 522,000, then I think it is necessary to distribute the oil in approximately the method that is used.

Q. All right, they could have stopped that thing down at wells from one to 500 potential?

A. How was that?

Q. From one to 500 potential and allow them twenty barrels and then spread the balance of it out by some other percentage factor among

the rest of the wells and stayed within the 522,000 barrels daily allowable without creating waste, couldn't they?

A. Well, if they had done that they would have had to lower the marginal from twenty barrels, which with the Saturday and Sunday shutdown amounts to fourteen barrels.

Q. Oh, no, you misunderstand me. They could have said every well having an hourly potential of 500 barrels shall be allowed to produce twenty barrels, and then they would say all wells, the balance of them after you find out how much oil that will be, and there is so much left, the balance of it will be prorated amongst the rest of the wells on some per cent factor and still stay within the 522,000? Of course, some of those better wells might have gotten a little less than twenty barrels or maybe a little more, but I am talking about from a standpoint of waste.

A. Yes, they could have done it that way without materially changing the waste factor.

Q. You can produce one of those—you can produce one of those wells over there that has 900 barrels an hour potential at a rate of fifteen barrels a day without creating waste, can't you, without injuring the well?

A. Oh, yes, you could do that.

Q. All right, so waste as you see it has no relation whatever to this line they draw under the 860 wells—wells of the 860 potential—waste as you see it has no relationship to the line they draw between all wells having 860 barrels hourly potential and wells having 865 barrels and more potential, waste has no relationship to the drawing of the line at that figure, at that particular place. It is a matter of how they are going to divide it up among them?

A. That is true providing you don't cut into your wells in your method down to less than ten or fifteen barrels a day.

Q. Those wells over there, lots of them are producing on ten barrels a day, are they not, and profitably? There are operators, at any rate, who continue to produce them when they have only ten barrels.

A. Yes, sir, they can operate them. They can't drill wells and operate them at that rate.

Q. Mr. Hudnall, under the production that has been over in the East Texas Field, with the price about \$1.10 a barrel, it has been a little above or a little below that over the last year or two, but it has ranged around that figure, has it not?

A. Yes, sir.

Q. And with twenty barrels a day and \$1.10 oil, one of those wells will pay out in a little over two years, will it not?

A. Yes, on twenty barrels. It will, of course, on ten barrels eventually.

Q. That is what I am talking about, on twenty barrels it will pay out in just a little over two years, will it not?

A. Yes, without the Saturday and Sunday shutdown. With the Saturday and Sunday shutdown I think it takes a little longer.

Q. Allowing seven days a week production, one of those wells, the driller, I mean the operator, will get the cost of drilling and equipping back in something like a matter of two years?

A. That is right.

Q. Now, how many wells did you say were drilled in 1936—1937?

A. During the year 1937?

Q. Yes.

A. A little over 2,000. I will have to get my records to give you the exact figure. During the year 1937 there were 2,351.

Q. 2,351. During 1938 how many were there?

A. 1,771.

Q. All right, that is about 4,000 wells?

A. Yes, sir.

Q. Out of 25,000?

A. Yes, sir.

Q. For the most part, the remaining 21,000 or 22,000 wells ought to have been paid for out of their operation long before this time, isn't that right?

A. Well, yes, of those that were drilled in the early part of 1937.

Q. Well, what I am getting at is this, you drilled in 1937 and 1938 approximately 4,000 wells?

A. Yes, sir.

Q. Well, that leaves about 21,000 that were drilled prior to that time?

A. Oh, yes, most of those would be paid out.

Q. I imagine of that 20,000 there, 21,000 there, there ought to be pretty nearly all of them paid out?

A. Most of them. Some on the pump wouldn't.

Q. Now, from the standpoint you were talking about, profitable operation of a well, after a well is paid out, why, it can be operated at a profit on an allowable from five to ten barrels a day, can't it?

A. You are cutting hairs pretty fine when  
524 you pinch wells down to five to ten barrels a day. They can be operated but not with much profit. I had one well on the west side of the field I had to abandon when it got down to ten barrels a day, and that was when we had a little better price than we have now.

Q. That was over in the water zone, wasn't it?

A. Yes, sir.

Q. You were having to take care of a good deal of water with your five barrels?

A. Yes, sir.

Q. All right, that complicated it considerably when it came to operating costs?

A. Yes, but there are some 3,000 or 4,000 wells making water that would have to be considered if you attempted to pinch those below ten barrels.

Q. Where you have water to deal with that complicates the thing, but wells in that field if they are paid out, they can be operated at a profit on some production of somewhere between five or ten or twelve barrels a day?

A. That is correct.

Q. Now, then, Mr. Hudnall, you stated that you thought the potential; the taking of the potential of a well, reflected certain of the facts, certain factors or certain qualities with respect to the property on which it was located. Will you mind explaining those again, please?

A. Porosity, permeability, pressure, structural position, the degree to which the sand itself is saturated with oil, and the amount of connate water.

Q. Now, let's see, pressure, porosity—

525

A. Yes, sir.

Q. Permeability.

A. Yes, sir.

Q. Degree of saturation.

A. Yes, sir.

Q. Connate water.

A. Yes, sir.

Q. And what was the other?

A. Sand thickness.

Q. Well, sand thickness and saturation?

A. Yes, sir.

Q. All right. Now, then, Mr. Hudnall, suppose this, suppose that I have got a tract of land that has ten acres in it and you have a tract of land adjoining it that has twenty acres in it, and I drill—our sand conditions are comparable both as to thickness, porosity, permeability and so forth, and that your pressures are comparable, and that I drill in my tract of land and I drill into the

sand three feet and you drill over on your tract of land the same sort of, using the same size drill bit, we equip them alike, but you drill down into that sand thirty feet, and so we put our two wells on a potential test, who is going to get the most oil?

A. You will get a little more oil.

Q. With three feet penetration?

A. No, the one with thirty feet penetration.

Q. You have thirty feet penetration and I have three feet.

A. I will get a little more oil.

526 Q. That little will get to be a good deal in time, won't it?

A. Well, of course, the permeability is a much bigger factor, generally speaking, than the others. You could have three feet of sand that could give you the maximum capacity; there or some wells in the field that had less than five feet penetration that made up above 800 barrels an hour.

Q. In the example I stated I am assuming that your tract—that the conditions with respect to pressure, porosity, permeability, sand thickness, saturation, position on structure, all of those things are equal, and your tract and mine are, they are so nearly equal we could call them the same thing for all practical purposes, but you take in thirty feet of sand in your well and I take in only three in mine.

A. Under most conditions thirty feet of penetration would get more and a little bigger potential.

Q. It would even get it if there was a little bit of advantage in either pressure or porosity or permeability as between—in favor of the well that didn't take in but a tenth as much sand?

A. Well, that is true, but it really isn't a big factor, generally speaking, in the East Texas Field.

Q. Now, of course, if the well with the larger bore is going to get more oil, a well with a larger bore is going to get more oil, isn't it, all factors being equal?



A. A little bit, yes.

Q. All right. Now, Mr. Hudnall, do you subscribe to the proposition that by taking the potentials of certain wells you can thereby draw lines and show just where the good wells will fall and the bad ones will  
527 fall, as it is done on that? This one here that has the red spots on it. This one. I am not talking about your map, I am talking about Exhibit 38, I believe, the Railroad Commission potential map. Yes, Exhibit 38. Do you subscribe to the proposition that by taking those potentials on those wells scattered around there you can draw lines and fix the potential?

A. You can draw lines that will give you somewhat the average potential of the averages in the wells in between the wells that the tests were made on. Actually if you tested every well you would get a little different picture.

Q. Well, as a matter of fact, even on this  
528 map and between these lines, it is a fact, is it not, that there are wells in between the 200 and 300 foot potential lines that are pumping wells today?

A. Yes, sir, that is true.

Q. And there isn't any machine made by which you can pump either two or three hundred barrels of oil an hour out of any East Texas well that has to be pumped?

A. I don't think they actually do that. There are a few wells on the west side where they pump 4000 barrels a day out of them.

Q. Twenty-four hours a day?

A. Oh, yes.

Q. Well, that is a good deal of difference between 200 barrels an hour and 300 barrels an hour.

A. 200 barrels an hour for twenty hours would be 4000 barrels.

Q. 4000 barrels?

A. Yes, sir. ◊

Q. 4800 for twenty-four. Now, there are some wells between the three and four hundred contours lines that are pumping wells; is that true?

A. Yes, sir, that is true, too.

Q. Now, do you know whether these potentials were taken as reflected here are the potentials that were taken in recent months or way back there a year or two or three years ago?

A. Those potentials were taken in October or November, 1935, I believe, maybe 1936.

Q. About three years ago?

A. Yes, sir.

Q. Now, Mr. Hudnall, I suppose you also subscribe to the proposition that though there may have been some reduction in pressures that if that field was closed in that the water drive would automatically restore those pressures to what they were, approximately?

A. It would in a geological period. It wouldn't in a year or two years or five years.

Q. What?

A. It would not, in my judgment, in five years time.

Q. It would not, in your judgment, in five years time?

A. I don't think so.

Q. You don't. That geological period is an indefinite sort of time to me. I don't know what a geologist means by that. Anyhow, it wouldn't do it in four or five years.

A. That is right.

Q. But there is, as shown by the box model, the first one introduced in evidence, there is a tremendous head of water bearing up against that oil sand from the west, isn't there?

A. Yes.

Q. And that water is there and being added to as time goes on, isn't that true?

A. Well, there is some addition to the volume of water at the outcrop, but I think it has no effect what-

soever on the East Texas field because there is sufficient volume anyhow within a radius of one hundred miles from that field before you get to the outcrop to give you an ocean of sand, the sand gets to be 600 feet deep and there are billions and trillions of water out there.

Q. And that water is pressing against that  
530 sand, and ultimately if you closed in the field and closed up all of the wells that would in time restore that pressure over there?

A. It would if you gave it time.

The Court:

Is that all salt water?

A. Yes, sir, varying in salinity as you get away from the outcrop, the saltier it gets.

Q. Now, do those pressures—I mean do those factors of—what about the porosity of this sand, does it change from time to time?

A. I think there is a slight diminution in the porosity of the sand when you lower the pressure. The exact amount of it, I don't know how to calculate, but I think there is a diminution in porosity.

Q. But it would be rather infinitesimal, wouldn't it?

A. If it were loose sand it would amount to considerable. If it was just plain beach sand, it would be a pretty large factor, but while in the consolidated feature, it isn't a very large factor.

Q. Now, Mr. Hudnall, do you subscribe to the theory that you can take pressure around on a few key wells and draw lines and thereby tell about what the pressures are over the field?

A. Yes. You have a pretty good idea on it, the more wells you take the more accurate map you get, but the pressure map is fairly accurate.

Q. So, if you were to close that field in and keep it closed in ultimately the water pressure would restore,

the force of the water would restore the field pressures substantially, as would be reflected by your potential map?

A. Yes, sir.

531

Q. I mean by your pressure map?

A. Yes, sir, it would do that.

Q. Now, then, if you took potentials, then your potentials ought to be the same as they were before, wouldn't they? You have the same pressure, you have the same porosity, you have the same permeability?

A. No, they—

Q. You have the same sand?

A. No, they would not be.

Q. They would not be?

A. No, sir.

Q. All right, you have the same pressures back, you have the same porosity, you have the same permeability?

A. Yes, sir.

Q. You have the same sand, you have the same position on structure?

A. No, that has changed very materially.

Q. Suppose you closed in. Now, you haven't moved anything up this incline as shown in this little Exhibit 33, the only thing that has come up is the water to restore your pressure?

A. You have taken out a billion and three hundred million barrels of oil, and when you open up an oil well to produce it, it is the expansion of that oil around the bottom of the hole that causes the flow. Now, if you decrease that volume you will decrease the amount that can expand around the bottom of the hole, and thereby decrease its potential.

Q. All right, you have the same pressures  
532 back, by closing in your wells the water has restored your pressures?

A. Yes, sir.

Q. And the only thing is your water table has risen and restored your pressure. Now, you were over there when Mr. Sterling closed that field in under martial law?

A. Yes, sir.

Q. And it was proved that the pressures built up?

A. Yes, sir, definitely.

Q. You were over there when the Railroad Commission closed it up a couple of times, weren't you?

A. Yes, sir.

Q. And it was proved that the pressures built back up perceptibly so?

A. Yes, sir.

Q. And it was closed under martial law for about thirty days?

A. It was closed in August 19th., and opened up September 5th.

Q. Under martial law?

A. Yes, sir.

Q. All right, in that period, that is not a geological age, is it, sixteen days?

A. No, but the physical condition in a large part of the reservoir is quite different now from what it was then.

Q. All right. Now, the Railroad Commission has closed it in some two or three times, two times, maybe three?

A. Yes, sir.

Q. And that was only for a matter of a week or two at a time?

A. Yes, sir, that is correct.

Q. And the pressures built up then?

533 A. Yes, they built up some in each case, but the rate of build-up, it starts off up and builds up very fast the first day and the second day a little less and so on until you approach a geological period of time to bring it back to its original.

Q. All right, if you closed in the field permanently would any of the 71 wells that are shown there as key wells, would any of those wells pass out?

A. I don't think so.

Q. You don't think so?

A. No, sir.

Q. All right, if you closed it in and they built back up their pressures, their potential ought to be the same, ought it not?

A. No, sir, it will not.

Q. All right, the factors are all the same, aren't they?

A. No, sir. I think I can explain it very concisely. You do not have as much oil under that field today as you had then, and the thing that causes a well to flow is the expansion of the oil, so if you don't have as much it can't expand as much.

Q. You have the Woodbine Basin that you can't change, can you?

A. Well, I don't think it would change as long as you had it filled with water.

Q. All right, it is there, you have the sand in there, and you have the underlying structures that control the position of the sand and now, then, the expansion of the oil, you say is the thing that enables the well to produce?

A. Yes, sir, that is correct.

Q. That is a factor in pressure alone, isn't it?

A. No, it is pressure times volume.

Q. All right, let me ask you this question, has  
534 that water drive got anything to do with the producing of oil in the East Texas Field?

A. Yes, sir.

Q. All right, the expansion or capacity of the oil to expand is a factor in pressure, is it not, but pressure is made up both of water drive and the expansive quantity, quality of the oil to expand?



A. Yes, sir, but of course, the volume that you have definitely is one of the factors that tells you how much it can expand. If you decrease that volume by a billion three hundred million barrels you couldn't possibly have the same amount.

Q. Don't you call these potentials, aren't they the same as you had in 1935, today you are using the 1935 potentials?

A. I think that is, so. I am not sure whether it is 1935 or 1936. I am sure the engineering department of the Commission could tell you the exact year.

Q. In any event, it is the pressure in the field that causes the oil to flow without the aid of pumps and things of that kind? That is a water drive field, isn't it?

A. Yes, it is part water drive. Now it is very largely water drive.

Q. Now, so far as oil expansion is concerned, that is just one of the things that go to make up the total pressure, isn't that right?

A. Yes, sir, that is true, but of course the pressure that I am talking about is the decrease in pressure when you open the well up.

Q. I understand that is what you are talking about, but I am talking about when you get those pressures back up there.

A. When you get them back up there, there will be a billion and three hundred million barrels less oil than there was before, and, consequently, those wells will not flow as much oil as they did the first time.

Q. All right. So, when you go to rate an oil field you consider volumes, do you not?

A. Oh, yes.

Q. I believe, Mr. Hudnall, that you have heretofore testified that there is a migration of oil from East to West in this field, haven't you?

A. Yes, sir, there is.

Q. All right. Now let's take this map right here, that is your Exhibit No. 40. You can see from there. I am just going to illustrate to you. This is your Exhibit No. 40. Now, this oil, according to your testimony—before I get—yes, I will start here. According to your—my understanding of your theory of this thing is that this oil, there is a migration of oil from east to west—from west to east?

A. Yes, sir, there is some migration in some areas; where the permeability is high there is more than in the areas where it is low.

Q. Now, as this oil migrates across here some one is going to gain and somebody is going to lose, are they not, under a per well allowable?

A. Yes, sir.

Q. As you take from all wells in the field substantially equal amounts of oil, going from the west to east somebody is going to lose?

A. Yes, sir.

Q. Somebody is going to get more?

536 A. Yes, sir, everybody that lies west of the approximate middle of the field is going to lose some and those lying east of the approximate middle of the field are going to gain some.

Q. These people over here are going to lose some?

A. Yes, sir.

Q. These people over here are going to gain some?

A. Yes, sir.

Q. These people on the west, the man on this lease, the C. H. Rhoades Lease is going to lose some oil?

A. It depends on what density his fee has been drilled up. If more densely than the area around him he may get more than he would lose by migration.

Q. In other words, if his lease is drilled to the average density, the owners on the Rhoades survey are going to lose some oil?

A. Yes, they would lose a little.

Q. All right. Now, then, over here on the John Rud-  
dell Survey are these people over here going to gain  
some?

A. Yes, sir, they will.

Q. All right. Well, take here the Rayne Survey, as-  
sume that is drilled to the average density, are they going  
to lose some oil?

A. Yes, they would lose a little.

Q. All right, the C. H. Alexander Survey, assume the  
same density, are they going to gain?

A. They will gain a little bit.

Q. So, somewhere between there there is a  
537 line and east of that line you are going to lose oil  
—if you are west you are going to lose oil?

A. Yes, sir.

Q. If you are east of it you are going to gain oil?

A. Yes, sir, that is correct.

Q. Now, then, this Railroad Commission order as it is  
written, contributes to that situation, doesn't it?

A. Yes, sir, any order that you would write and pro-  
duce the field on a practical basis would do the same  
thing.

Q. If you allowed them an equal amount per well per  
day, whether you did it with a figure of twenty barrels  
or a figure of forty barrels, anything that allows the wells  
to withdraw or on a per well basis per day, is going to con-  
tribute to a situation in that field where a man to the west  
loses, and a man to the east loses—I mean gains?

A. I think any order that—

Q. Now,—

Mr. Hart:

We object. Let the witness finish.

The Court:

Finish your answer.

A. I think any order that you put on the East Texas Field at all that would be practically the situation.

Q. All right.

A. Would also take from some, particularly those on the west side, and give to those on the east side.

Q. All right, this order doesn't attempt to relieve or alleviate that situation of loss of one man's oil and the gain of oil by another man, but rather it contributes to that? You have already testified to that, haven't you just a minute ago?

538 A. No, it doesn't attempt to adjust that.

Q. In fact, the fact that it gives each well the same amount is a contributing cause to it. I believe you state?

A. Well, I think that any method you would use would do that.

Q. I am not talking about any method, I am asking you where you give each well the same amount of oil that that sort of plan contributes to causing one man to lose and the other fellow to gain?

A. Yes, sir, it does that.

Q. All right. Now, Mr. Hudnall, take this tract, have you got a map here of this Rowan & Nichols Tract and Wood Tract?

A. Yes.

Q. Is it handy around here?

A. Yes.

Q. I thought maybe you might have one on a large scale?

A. I have a big scale map of it.

Q. Mr. Hudnall, let me ask you this question. Let me ask you this question, is the Wood tract, the well on the Wood tract at this time, gaining oil—draining oil from the Rowan & Nichols tract?

A. I think it is.

Q. Your answer to that question was you think the Wood well is draining oil from the Rowan & Nichols well?

A. Yes, I think it is.

Q. Now, Mr. Hudnall, you gentlemen made some reference about what time would do, and I think Mr. Cottingham, did you hear Mr. Cottingham's testimony with reference to what he called the time factor?

A. Yes, sir.

539 Q. All right. Now, Mr. Hudnall, there is nothing about the time factor, is there, that will straighten out the difference between Mr. Wood getting the same amount of oil per day off of a well on an acre or a well on a tenth of an acre, whichever it may be, and Mr. Rowan getting oil off of twenty-five acres drilled at a density of one well to five acres?

A. No.

Q. There is nothing in the time factor or time element that Mr. Cottingham talked about and that you have only slightly referred to that will equalize that difference, is there?

A. No, except in time Mr. Rowan may get a number of additional permits.

Q. But I am talking about right now, as the thing is right now?

A. No, as long as it stays like it is right now, there is nothing to compensate for that.

Q. All right, and as time goes on, if the drilling density remains the same and the per well basis of proration remains the same, the longer the time factor is the more the drainage from the Rowan & Nichols tract to the Wood's tract, isn't that true?

A. In total barrels, that is correct.

Q. Now, Mr. Hudnall, I believe you refer to this east Texas field as a common reservoir, do you not?

A. Yes, sir.

Q. I believe also you have made a sand thickness map on this tract of land haven't you?

A. Yes, sir, I have.

Q. And you are in the business, are you not,  
540 of having oil properties appraised, that is a part—  
you make employments to value oil properties?

A. Yes, sir, a great many.

Q. You have valued a many a one in the East Texas Field, haven't you?

A. Yes, sir, that is correct.

Q. And in valuing them you have estimated sand thickness and porosity and permeability and taken into account all factors including sand thickness?

A. Yes, sir.

Q. In valuing them?

A. Yes, sir.

Q. You have valued for people who wanted to buy, who wanted to trade, and for persons who wanted to lend money on oil production, haven't you?

A. Yes, sir.

Q. And in making those valuations you take into consideration sand thickness?

A. Yes, sir.

Q. In appraising how much oil there is there and what the person's property is worth?

A. Yes, sir.

Q. And you figure cubical content? In other words, you get three dimensions, you don't just get how much the well will flow, but you try to get the acre feet of oil underneath the lease?

A. I usually do, I don't always.

Q. Now, Mr. Hudnall, I will ask you, if you haven't testified that the—with respect to the East Texas  
541 Field—that if you attempt to distribute the allowable in such a way that you give each lease the oil that underlies it you must necessarily consider acreage?



A. Yes, if you want to try to do that instead of allocating it.

Q. If you want to give every man an equal opportunity to produce his oil, or the equivalent of the oil under his lease equal with everybody else in the field, you have to take into account some acreage factor, haven't you?

A. Yes. Of course, you may take it in with your well spacing program, the number of wells that would still give him the advantage, the opportunity, either the number of wells or acreage.

Q. In other words, under any other program or any program of proration that forgets that deprives one man and helps the other?

A. That is correct.

Q. You cannot do it and make the opportunities equal and forget acreage, which you may take into consideration by measuring the surface of the land or the density, you have to consider the volume the man has?

A. Yes, you have to consider the oil a man has within the well. I sometimes consider the value of properties within the drainage area, regardless of the wells.

Q. Now, Mr. Hudnall, you are talking about the East Texas Field here, we have been in all our examination?

A. Yes, sir.

Q. Mr. Hudnall, your sand thickness maps have been in the possession of the Railroad Commission for many, many months, have they not?

542 A. The first sand thickness map or one of the earliest sand thickness maps I made, that was in 1933, was exhibited at one of the state-wide hearings. Now, as to whether they had it, I don't know.

Q. It has been accessible to them, or they have had access to it at any time they wanted to see it?

A. Oh, yes.

Mr. Moody:

I want to correct myself before the Court, and in deference to Mr. Cottingham. I don't want to appear in a bad light. What I meant in speaking of the map was the map was available to them, Mr. Cottingham, I wasn't trying to reflect on you in the quarrel we had a few minutes ago. That is all.

The Court:

Do you have a map covering the entire field?

A. Yes, sir, I have a sand thickness map covering the total field. Not saturated sand thickness, but the Woodbine section.

The Court:

You testified, I believe, you consider that entire field a common reservoir?

A. Yes, sir, it is common in that there is some communication from one part to the other.

The Court:

You don't think it could be regulated separately?

A. Oh, it could be regulated separately, but it is pretty hard to find a point of demarkation.

The Court:

There is no line you could find to regulate one part one way and another?

A. There are no physical barriers where you could say this part should be this way and this another. It would be pretty difficult.

543

(At this time a recess was taken until two o'clock P. M. of the same day, when the following proceedings were had):

Re-Direct Examination.

Questions by Mr. Hart:

Q. Mr. Hudnall, Governor Moody asked you about the drainage from the Rowan & Nichols tract to the R. M. Wood tract. Under the present situation, during the period of a little more than six years during which Rowan & Nichols had from two to five wells drilled and operating on their tract, and when Mr. Wood had no wells on his tract, were Rowan & Nichols draining oil from Mr. Wood's tract?

A. I think they were.

Q. Could you give any estimate of how much oil was being drained from under the Wood tract to the Rowan tract during that period of time?

A. I think the Wood tract was drained to the extent of around ten thousand barrels per acre, and part of that was drained by the Rowan & Nichols wells and part of it by the adjoining wells to the north, south, east and west, so out of that Rowan & Nichols probably never got more than four to six thousand barrels.

Q. Have you examined the maps showing the locations of wells and computed the density of the drilling on a strip a mile wide from the Rowan and Nichols wells east to the east edge of the field?

A. Yes, sir, I have.

Q. Is the average density of drilling on that  
544 strip greater or less than the density of drilling on the Rowan & Nichols tract, counting the sixth well that has been granted by the Railroad Commission?

A. Counting the sixth well on the Rowan & Nichols lease, the density from their lease eastward from a strip a mile wide using it as the center of the strip, the approximate center of it, the Rowan & Nichols lease, is slightly less densely drilled than the Rowan & Nichols lease would be with the six wells.

Q. Taking an eight times folded area around the Rowan & Nichols tract, an eight times circular area around the Rowan & Nichols tract, are most areas more densely drilled or less densely drilled than the Rowan & Nichols tract?

A. They are less densely drilled than the Rowan & Nichols tract.

Q. If you take a half mile circular tract with the Rowan & Nichols tract as the center, is that area more or less densely drilled than the Rowan & Nichols tract?

A. It is less densely drilled.

Q. You take a three quarter mile circular area, is that more or less densely drilled than the Rowan and Nichols tract?

A. Less densely drilled.

Q. Take a mile circular area, is that more or less densely drilled than the Rowan & Nichols tract?

A. Less densely drilled.

The Court:

Is there any reason to go out in a fan shape that way.

Mr. Hart:

We just wanted to show the extent of the drilling, Your Honor.

545° The Court:

If you take a circle that is a mile wide, it is bound to include the other.

Mr. Hart:

Yes, sir.

Q. During the time that Rowan & Nichols has been more densely drilled than the surrounding tracts, has it drained oil to it from these other tracts?

A. It has had an opportunity to drain oil to it and I think it has drained some oil to it.

Q. And during that period of time has it acquired more oil per acre than the surrounding tracts?

A. I think it has, but I don't actually have the production figures on the other tracts, but just due to the fact that the allowable has always been essentially on a per well basis, if the other tracts had fewer wells per acre than had the Rowan & Nichols tract, why, the Rowan & Nichols tract would necessarily have produced more oil per acre and would have tended to drain the oil into it from these adjacent tracts that were less densely drilled.

Q. Now, Governor Moody asked you about the situation as to drainage from the west to east, and I believe you said in response to his question that any practical allocation would give some advantage to the leases to the east, is that correct?

A. That is true, considering just purely the water drive feature of the field. Of course, the east also is at some disadvantage in that the pressure decline, it declines faster over there than it does in the other parts of the field, so you have an abandonment that starts from both sides of the field.

Q. That is what I wanted to ask you. Govern-  
546 or Moody put a theoretical situation to you. As the actual situation exists all the areas on the east side of the field will be the last ones to receive the oil, or in the situation as it actually exists all the leases in the center of the field in the neighborhood of Rowan & Nichols will be the last ones to receive the oil?

A. The facts in the field up to the present time clearly show that certainly a great many wells will be abandoned on the east side of the field long before water ever gets there, and the exact position at which the final production will come from cannot be accurately determined at this date. My judgment is that it will be west of the Rowan & Nichols tract, slightly west of it rather than east of it.

Q. In other words, the Rowan & Nichols tract is in the vicinity in the field where the last production will occur, that is, where the wells will produce longest, is that correct?

A. I think so.

Q. Now, if you have a top allowable and you allow the present marginal allowance, then there necessarily won't be much to pro-rate on any basis, will there?

A. No, sir.

Q. If you adopted the method suggested by Governor Moody of giving the wells which were below the 500 barrel contour, that is which had an hourly potential of less than 500 barrels per hour—

Mr. Moody:

Pardon me, Mr. Hart, I didn't suggest that, I asked him if there is any reason why that couldn't be done. I wasn't advocating it, I was trying to find out if there was any reason for the 860.

547 Q. I will change the question. If the Commission should follow the plan which was referred to in the questions by Mr. Moody of limiting the twenty barrel per well marginal allowance to the wells that fell outside of the 500 barrel per hour potential contour, would that or not mean that wells toward the center of the field with higher potentials would get an allowance of less than twenty barrels per day? Do I make myself clear?

A. I don't believe they would get less than twenty barrels if you had a minimum of twenty on any of them, those in the middle of the field, located such as Rowan & Nichols—

Q. No, I didn't make my question clear, Mr. Hudnall. If you followed the method of allowing twenty barrels per day to the—only to the wells outside of the 500 barrel contour and applied strictly a potential allowance to



those with higher potentials, you didn't give them the minimum allowance, but applied strictly a potential method of allocation to the better wells inside of those contours, would you or not have the situation where some of the wells that had a higher potential than 500 barrels per hour would be receiving less than twenty barrels per day? The wells between the 500 and 860 contour?

A. You can't if you have a minimum of twenty barrels on any of them.

Q. I am not assigning a minimum of twenty barrels to those inside the 500 contour.

A. You would in that case, if you assigned a minimum of twenty barrels to all wells outside of the 500 barrel per well potential—per hour potential contour 548 . . . and then a percentage of the potential of the remaining wells.

Q. To the better wells inside?

A. To the better wells inside. Some of them would get less than twenty barrels, say down to fifteen barrels a day, and others would get up to maybe twenty eight barrels a day.

Q. In other words, if you followed that method of allocation you would be giving some wells that had higher potentials less allowance than other wells which had smaller potentials.

A. That is correct.

Q. Now, does the fact that most of the wells in the field get substantially the same amount of oil per day at the present time mean that the poorer wells will ultimately get as much oil as the better wells?

A. No, sir. Undoubtedly the poorer wells are going to be abandoned long before the better wells, and consequently the better wells will in some measure be compensated for the disadvantage that they are at now, by the element of time.

Q. Considering the increase of abandonments over drilling of new wells, which you have already spoken of,

will that mean that the rate of take by the better wells in the center of the field which go out of production last will be increased?

A. Yes, sir, I estimate that at the present rate of abandonment, plotting a curve on the rate of abandonments that within the next ten years, there will be around five thousand wells abandoned, something slightly over that. The allowable of these 5000 wells would be—at twenty barrels each—would be around a hundred thousand barrels. Now, this 100,000 barrels could be assigned to the wells in the middle of the field so that their allowable will increase as time goes on.

The Court:

Without waste of any kind?

A. Yes, without waste of any kind.

The Court:

Is it your idea that regardless of how few or many wells there are over there, you can take the same top allowable out of the field?

A. No, I think you would reach a point to where you would have to increase your top allowable. I think the more wells you drill, the more oil you get out regardless of how you operate.

The Court:

When these wells are cut down by abandonment would you still have this top allowable?

A. The top allowable is the commission's.

The Court:

You don't know what that will be?

A. No, sir, but I don't see any particular waste from restricting wells unless they are restricted to a point where they will be abandoned due to economic reasons, and then you will cause waste in my judgment.

The Court:

Now, does it necessarily mean that one of those wells that has to be plugged for the time being that that is an irretrievable loss and that it can't be opened up again?

A. The experience in most all fields has been, and I think it will follow in this field, that once a well is plugged and abandoned, it is never opened again. The probable operation in the future should the price of oil reach the point to justify further development would be they would drill new wells in between those that were abandoned. That has occurred in a number of fields.

550 Q. Have those wells which have been drilled between other wells that have been abandoned, have they produced oil?

A. Yes, in a great many fields where the old wells which have been produced to where they are completely depleted, new wells between the old ones have been completed and produced at commercial rates for considerable periods of time.

Q. What does that show about the drainage area of wells and about the regularity or irregular characters of the sand?

A. It shows that the drainage area—

Mr. Moody:

That hasn't happened in the East Texas Field. I object to it.

Q. Has that happened in the East Texas Field, Mr. Hudnall?

A. I know of one case in the East Texas Field where that has recently happened. Take the well that I owned an interest in myself was plugged and abandoned, and about three thousand feet northeast of it there was another well that was plugged and abandoned. The operator that owned a lease in between has gone in and gotten some

three or four flowing wells that make no water. Now, that condition does not exist generally. There are a few other areas where it has occurred.

### Re-Cross Examination.

Questions by Mr. Moody:

Q. All right, in the illustration you just used, the well you were interested in, you bit off too much sand and got some water and you couldn't get enough oil to justify the water you took in, and the same thing happened with the man up north, and what happened was you had drawn water in and trapped off the oil where the fellow  
551 went down and got it, the oil that was in the trap, that is the whole story of that isn't it?

A. No, the facts are when I drilled my well I stayed on the ground when the well was being drilled and we ran a steel measurement. When we got on the top of the sand we moved in cable tools and we drilled in one foot and quit. The well didn't make any water for about ninety days and then it started making water and never was produced at more than twenty barrels a day and the water encroached to the point where it had to be plugged and abandoned, and you couldn't have gotten any more oil out of it except at an economic loss.

Q. Whether you drilled twelve inches into the sand or twelve feet you were drilling at the water table, weren't you?

A. That is true, but there was another well that was located about a half mile northeast that got the top of the sand within one or two feet of the same level at which my well got the sand. That well produced over 500,000 barrels of oil; according to the information I have that is still a flowing well and making no water and my well is plugged and abandoned and gone.

Q. But the reason this man between your well and the other abandoned well who has drilled three or four wells,

the reason for that was there was a pocket of oil in there surrounded by water, isn't that true?

A. Yes, I think that is true.

Q. Now, there are one or two things I forgot to ask you this morning. One of them is that you calculate, do you not, oil reserves under lands and use the same formula that is used by—that Mr. Buck testified to from the witness stand when he was, on the witness stand, shown by the exhibit that is offered in evidence here?

A. I don't remember his formula, but I used, I am sure, a similar formula.

Q. That includes sand thickness?

A. Yes, sir.

Q. And you determined the cubicle content and taking into consideration other factors, porosity, permeability, and so on, and determined the amount of oil underneath that particular lease?

A. Yes. I usually limit it to drainage area of the wells rather than the lease in East Texas.

Q. Well, if you are figuring a well, but I am talking about, if I wanted to buy a lease from somebody and I called on you to estimate for me the oil wells there, you would undertake it wouldn't you?

A. I would probably set that up as I usually do in two ways—

Q. I don't care what ways you would—

Mr. Hart:

We object to counsel interrupting the witness. We ask that the witness be allowed to complete his answer.

Mr. Moody:

I am willing so long as he is answering my questions.

Q. If I asked you to calculate the reserves under there, you could do that all right and you would take into consideration sand thickness in doing it?

A. Yes, sir.

Q. Now, the other point that I had in mind to ask you about that I overlooked this morning was this. You are talking about getting oil at some—a man getting  
 553 his oil at some remote date far in the future. With oil now worth one dollar or \$1.10 a barrel, how much will that barrel of oil that is now worth \$1.10 be worth twenty years from now? I mean by that, tell me, compare the present value of a barrel in the hand that is worth one dollar, let me have that value twenty-one years from now or twenty years from now?

A. There is just one thing you will have to give me in that problem and that is the interest rate at which you are going to deplete that.

Q. You usually use six percent in depleting these values, do you not?

A. It depends on whether I am trying to arrive at market value or total net earning values.

Q. Suppose we take ~~six~~ percent, that is more customarily used than any other?

A. In the net earning value I say that is right.

Q. All right, suppose you take six percent. That would be about twenty one or twenty cents.

A. Close to it.

Q. Some where in the neighborhood of a sixth of what it is worth today?

A. Yes, sir, that is about right.

Q. Now, then, with reference to this morning you told me that if we had a good permeable sand, you and I had sands of equal permeability on our adjoining leases and equal pressures and so on and we drilled and you took thirty feet of sand and I took only three feet of sand that  
 554 your potential would be slightly higher than mine?

A. Yes, sir.

Q. That means to say, does it not, that if you have a permeable sand and all other factors are equal, why, a large amount of oil can be taken out of a thin sand as



well as out of a thick sand, providing a thin sand or a thick sand are both in contact with large supplies of oil?

A. That is correct.

Q. That is the principle you had in mind when you gave me that answer?

A. That is correct.

Q. All right. Now, then, based—let's apply that principle a little bit further. There are permeable sands on the east side of the East Texas Field are there not?

A. Yes, sir, there are.

Q. And there are sands that range in thickness twenty or thirty feet and on down to where they have five feet?

A. Yes, sir.

Q. All right, now you have testified that there are going to be abandonments on the east and on the west; the abandonments on the west are going to be caused by the encroachment of water, aren't they?

A. Yes, sir.

Q. The abandonments on the east side where you have a permeable sand and five feet of it on up to as far as you want to go, there aren't going to be many abandonments in that character of sand, are there?

A. The abandonments where the sand is permeable on the east side will be much less than where it is less permeable.

555 Q. I meant to say of the character of sand which I described?

A. Yes, sir, I so understood it.

Q. And where you have twenty feet of sand on the east side of the field, you have some permeable sand that will last for a good long while, haven't you?

A. I think that is true in there near the Rowan & Nichols lease.

Q. It is true all along in there isn't it?

A. No, from Kilgore south the permeability is reduced to where it is low.

Q. All right, from Kilgore south, that is less than the south half of the field?

A. Pretty close to the south half.

Q. The Court asked you this morning if you could have one rule for proration in one part of the field and another in another. The Railroad Commission did at one time did divide the field that way, didn't they?

A. They did before the fields were all connected, when that field was first discovered.

Q. Didn't they run a line through the Post Office at Kilgore and say all south of this line is in one section of the field and north is in another section of the field?

A. Yes, in the early life of the field the first well that was drilled was in the extreme end of the field—

Q. Well, pardon me, Mr. Hudnall. To try to refresh your memory, didn't they do that as late as 1933?

A. No, sir.

Q. It was earlier than that?

A. No, sir, the only time that order prevailed was in 1931 and it prevailed at the time there was three  
556 separate pools. No one knew where they were  
going to connect or whether they were going to connect.

Q. Well, the present order does not take into account the difference between the characteristics in the south end and the characteristics in other parts of the field?

A. Yes, it does in that that south end of the field where there is a lot of shale the potentials of the wells are much lower.

Q. Well, except as the per cent of 2.32 is figured on the last 7,000 barrels of oil out of 522,000 the existing order doesn't take into account any difference between the condition in the south end of the field and the conditions in the other ends of the field, in other parts of the field?

A. No, the practical application of the order does not. The basic principles of the order does.

Q. All right, so far as the man who has his well in the south end of the field that will make twenty barrels of oil a day, he gets within five barrels of the quantity allocated to the best well in the field, although he is in a poorer part of the field than the best well in the field?

A. That is true.

Q. All right, then, those differences are not taken into account?

A. No, sir.

Q. All right, and the fact that many wells in this more inferior part of the field are allowed to produce the same amount of oil as the better wells in other parts of the field has the effect to give the man with the better well a— or put him at a disadvantage as compared with the men

557 who have their wells in the poorer part of the field, they being allowed to produce substantially the same amount of oil, that results, doesn't it?

A. That is true.

Q. So a fellow in the best part of the field, where he has the most permeable sand the most oil and all those things, and is held to produce substantially the same amount of oil to a man in the south end where he has less sand and less permeability, a man in the north is placed at a disadvantage by this, he is at a disadvantage to the man down where the property is not so good?

A. That is true.

Q. That obtains all through the field?

A. Yes, sir.

Q. That affects Rowan & Nichols?

A. Yes, it does.

Q. And affects them disadvantageously?

A. Yes, at the present time.

Q. Now, let me ask you another question or two. You told Mr. Hart that you thought that Mr. Rowan and Nichols—the Rowan & Nichols lease would be somewhere about the place where the field would last go out?

A. That is true.

Q. Mr. Hudnall, I am afraid that you left your testimony before the Court as expressing it to be your opinion that wells over there where they have thirty or forty feet of sand on the east side of that field would be abandoned. You didn't mean to leave any such impression as that, did you?

553 A. Throughout most of the fields that is true.

I won't say I think it will be true in every case because in some areas they have a gravel bed that extends—

Q. I am talking about the east part of the field where they have thirty or forty feet of sand. You don't mean to intimate that those wells are going to be abandoned?

A. Yes, I think they will before Rowan & Nichols wells will.

Q. But that is a long time off?

A. That is true.

Q. Now, then, you said in your testimony there that you thought that their wells were in the territory that would last produce. That is just an estimate that you made from the general overall picture, isn't it?

A. That is true. The data that that is based on, generally speaking on, is this, the rate of abandonment up to the present time show that there is about two thirds on the west side and one third on the east side. Well, if that continues throughout the life of the field, then the final place of abandonment will be one third in from the east side and two thirds up from the west side.

Q. Well, Mr. Hudnall, you know that is not going to be the case in the face of your testimony that this oil keeps moving east all the time and you have pretty thick sands to the east and you have water coming from the west?

A. I think, generally speaking, that is going to prevail. Now, the testimony hasn't brought out as clearly as it probably should on that point what the situation was, but the wells on the east side are abandoned from the lack of pressure.

559 Q. All right.

A. The lack of pressure.

Q. I thought you said from the lack of permeability?

A. The lack of permeability causes the lack of pressure, but in the final analysis it is the lack of pressure. Now, the whole field dropping at the rate of some thirty pounds a year, it is obvious as the low pressure areas are always on the east side of the field that as the pressure drops on down to where the wells will not make their twenty barrels that wells that are located on the east side of the field will reach that stage long before the Rowan & Nichols wells.

Q. Let's see if I get your logic. Two thirds of the wells are being abandoned on the west?

A. That is correct.

Q. One third on the east?

A. Yes, sir.

Q. Therefore, the abandonment will move in, two thirds of the territory abandoned will be on the west and one third on the east?

A. Yes, sir.

Q. That is your philosophy?

A. That is exactly.

Q. Because there have been twice as many wells abandoned on the west, of the wells abandoned, two thirds were on the west and one third on the east, therefore the territory over which that abandonment will take place over the life of the field will be two thirds on the west and one third on the east.

A. Yes, sir, that is the way it will be.

560 Q. I want to ask you this question. On the Rowan & Nichols lease the sand thickness,—the sand beyond, the sand east of their lease is thirty feet higher to the top of it than it is on the Rowan & Nichols lease, isn't it?

A. Yes, sir.

Q. There is thirty feet more sand—this Court Room is about eighteen feet, twenty feet high, I guess, the ceiling. It is as deep as from the floor of this Court Room, the floor of this Court Room to the ceiling and then a third on up, the sand is that much higher than Rowan & Nichols on east?

A. Yes, sir.

Q. And it keeps on going until it pinches out?

A. Yes, sir.

Q. Judge McMillan asked you if the fact they plugged a well, if that meant they never would operate it again, or some question to that effect. You answered him on the basis that the well had been plugged, didn't you?

A. Yes, sir.

Q. Your idea was that it had had cement pumped in it down there?

A. Sure.

Q. When the Court used the word plugged?

A. Yes, sir.

Q. Now, if the Court had used the word closed in, your answer would have been different?

A. Oh, yes.

Q. You can close a well in, leave it closed in a long time without doing it any harm and open it up again?

A. You can do that.

Q. Now, you said that you thought, in answer  
561 to Mr. Hart's questions, that back before this Wood well was drilled that Rowan & Nichols were draining some oil from the Wood's lease?

A. Yes, sir.

Q. All right, whatever may have been the condition in the past with respect to that, it will never be the same again as long as the Wood well is producing from a tenth of an acre or an acre out of one well and Rowan & Nichols is producing five wells off five acres—five wells off twenty-five acres and each is allowed the same daily allowable.



Whatever the condition in the past was, that condition never will exist again, will it?

A. I don't think so.

Q. And from here on out, as it is prorated on this present basis, Wood will be draining oil from Rowan & Nichols?

A. I think he will.

Q. Let's see your figures there on density. What is this, how is this figured, the top one? Is that in a circle?

A. No, it is the first mile east just laying out a square mile.

Q. A square mile?

A. Yes, just laying out a square mile.

Q. And the center of the west mile of the square mile would be about in the center of the Rowan & Nichols lease?

A. That is right.

Q. And the density there is one well to five acres?

A. That is correct.

Q. For all practical purposes the same density as Rowan & Nichols?

A. Yes.

Q. You figured with this on six wells, didn't you?

A. In answer to the question. The question put it at six wells.

Q. We are trying it on five wells. There have been no six wells drilled. Now, the second mile east was drilled to a density of one mile to four acres?

A. Yes, sir.

Q. All right, so the average density of the two miles to the east would be four and a half acres wouldn't it?

A. Yes, sir.

Q. All right, now you take your folded area eight times the size, the average density there is greater than the density of the Rowan & Nichols isn't it?

A. Yes, with five wells.

Q. It is greater than the Rowan & Nichols?

A. Yes, sir.

Q. All right, you take your area—wait a minute, all of your areas, if you take your eight times the folded area, you mean by that an area of land that in reality there are three tracts the same size of the Rowan & Nichols tract across the top end, that includes the Rowan & Nichols, and three across the bottom means nine tracts, doesn't it? It means nine areas, including Rowan & Nichols that are the size of the Rowan & Nichols?

A. That is correct.

Q. All right, now, if you take that way of figuring and Rowan & Nichols with five wells on the edge of those—each of the other eight areas is drilled to a greater density than the Rowan & Nichols lease?

A. Yes, on an average.

Q. It is drilled, the Rowan & Nichols, one well to five acres and in that area the average density is one well to four and a quarter acres?

563

A. That is correct.

Q. All right. Now, when you take a circular area, put a point of the compass at the center of the Rowan & Nichols area and describe a circle nine times the size of the Rowan & Nichols, including the Rowan and Nichols—

A. This calculation only refers to the area that would be outside of the lease.

Q. All right, and the density there, they are drilled to a greater density than the Rowan & Nichols?

A. That is correct.

Q. Then, if you take a half mile or three quarters of a mile or a mile circle, just as far out as you have gone, the drilling density is greater than the drilling density on the Rowan & Nichols lease at this time?

A. Yes, sir.

Q. With five wells on it?

A. Yes, sir.

Q. All right, and if you go on to the west with your square miles, when you get way out to the fourth square mile, I mean to the east, the fourth square mile to the east, that even is drilled to a greater density than Rowan & Nichols?

A. Yes, sir.

Q. In other words, on all of the figures you have on this sheet, the only place where you show any area that is drilled to a less density than the Rowan & Nichols is the third mile east of the Rowan & Nichols tract, and  
564 that is just one-one hundredths of an acre less in density of drilling than the Rowan & Nichols, isn't that right?

A. That is correct.

(The above referred to instrument was thereupon received in evidence and marked Exhibit 42.)

Q. Now, then, if you are right that this oil is moving from east to west and also you said this afternoon again it was—west to east I mean.

The Court:

West to east, isn't it?

Q. Yes, sir. The fact there is a greater density of drilling east of the Rowan & Nichols tract on the average than the density of the Rowan & Nichols tract, that is going to aggravate, is it not, the hurt that Rowan & Nichols get from drainage by reason of this migration of oil?

A. Yes, sir, it will.

Q. Now, this proration order, per well allowable, doesn't make any allowance for this except as it is reflected by this potential factor which figures on 7,000 barrels out of 500,000?

A. That is right. It is Rule 37 that takes care of that.

## Re-Direct Examination.

Questions by Mr. Hart:

Q. All of those questions which Mr. Moody just asked you with reference to density assumes that Rowan & Niehols chose not to take advantage of their permit to drill their sixth well?

A. That is true. If they took advantage of that they would be greater drilled than any of these areas except the second mile east.

Mr. Moody:

I thought you asked him on five wells.

565 Mr. Hart:

I wanted to make it plain that it was five wells you asked about.

Q. Governor Moody asked you about a proration scheme dividing the East Texas field into more than one unit. I will ask you if that isn't a proration scheme which was applied by a central committee of operators rather than the Railroad Commission?

A. I think the Central Proration Commission is the one that sponsored the scheme. I think the Railroad Commission probably adopted some parts of it, but as soon as the Commission really took the field over to operate it themselves, it was considered as one field.

Q. Now, Governor Moody asked you about what the value of the oil would be if you were not able to take it out for some years if you discounted the value according to a rate of interest. Would there be any effect on the value of that oil if all the operators were allowed to draw all the oil on their leases at the same time, if they wanted to draw it out, what would be the effect of that?

A. I think it would decrease, based on past experience, to seventy-five cents, or fifty cents a barrel.

Q. If everybody should run open as much as they wanted to?

A. Yes, sir, it would drop to that pretty quick.

Mr. Hart:

I believe that is all.

The Court:

I want to ask this witness a question or two. I still have this matter in my mind. It may not be pertinent to the case, but still I would like to have it for the purpose of the record. There are some fields in Texas where the regulations are different as applied to different parts of the field, are there not?

566

A. I don't know of any, but there may be.

The Court:

That may not be true with regard to oil fields, but certainly it is true with regard to the gas fields.

A. I think probably the Statute covers certain regulations with respect to certain gas fields.

The Court:

Now, if you approached this field not with the market demand in mind at all, but simply with a view to eliminating underground and overground waste, is there any valid reason why restriction could not be made in the regulation of certain parts of the field where the field was ragged and poor, couldn't it be regulated according to its merits, and where it was better they could regulate it according to its merits? Is there any reason why you couldn't do that?

A. I don't know that there is.

The Court:

Do you have to treat them all alike?

A. I don't think so.

The Court:

Can you differentiate between them?

A. I think so, and the only thing I think would have to be considered from the viewpoint of preventing waste would be the minimum of reduction in allowable for certain wells, below which if you restricted them would be plugged and abandoned. Outside of that measure, which would be applicable to the poor wells, I see no reason why the better wells couldn't be given a better allowable.

The Court:

It is all just a question of how much you get out, isn't it?

567 A. That is true.

The Court:

Do you think an order could be written, then, that would differentiate between the wells on the basis of their capacity and reserve and that sort of thing?

A. Yes, sir, I think it could be, but I sure think it would go above the 450,000 barrels or 400,000 barrels a day, which in my judgment wouldn't hurt.

The Court:

As I understand your testimony it wouldn't hurt that field to go above that?

A. That is right, that is what I think.

The Court:

Do you think the amount fixed now is too conservative?

A. I think probably it is too tight.

The Court:

Is your eye fixed on market instead of conservation?

A. I think so. It is a little tight.



The Court:

All right, do you gentlemen want to ask him any further questions?

Mr. Moody:

No further questions.

Re-Direct Examination (Continued).

Questions by Mr. Hart:

Q. Mr. Hudnall, this schedule Governor Moody introduced in evidence, does that take into account wells which have been drilled since the permit was given to Rowan & Nichols to drill their sixth well?

A. Yes, this schedule takes into consideration the development as of January, 1939.

568 Q. It includes wells drilled between March, 1938, and January 1, 1939?

A. Yes, it does.

Re-Cross Examination.

Questions by Mr. Moody:

Q. Mr. Hudnall, if you cut those—put those wells at ten barrels instead of twenty barrels, then your five hundred twenty figure could be held the same or brought below it, in connection with your answers to the Court?

A. Yes, you could do that, but you couldn't drill any more wells, you would completely stop development on ten barrels minimum a day.

(Witness excused.)

Mr. Hart:

We wish to offer in evidence the map which was identified as Exhibit 40, and the schedule which was marked for identification as Exhibit 41.

(The above referred to instruments were thereupon received in evidence, having heretofore been marked Exhibits 40 and 41, respectively.)

Mr. Hart:

We would next like to offer in evidence the original proration order based on percentage of the potentials of the wells, dated April 22, 1933.

The Court:

Isn't that attached to the pleadings?

Mr. Hart:

No, sir. I understand, however, that they intended to offer it, but it hasn't been. This is the original potential order of April 22, 1933.

Mr. Tocker:

That has been offered as Exhibit 18.

569 Mr. Hart:

I next wish to offer in evidence the order of January 31, 1933, changing the spacing rule in East Texas from a 20 acre unit to substantially the present rule of 660 feet and 330 feet.

(The above referred to instrument was thereupon received in evidence, the same having heretofore been marked Exhibit 44.)

Mr. Hart:

We next wish to offer in evidence the order of September 27, 1935, with reference to the making of potential tests. This has been testified to to some extent by witnesses who have testified.

(The above referred to instrument was thereupon received in evidence, the same having heretofore been marked Exhibit 45.)

Mr. Hart:

We would next like to offer in evidence the order of December 6, 1935, with reference to the taking of potential tests.

(The above referred to instrument was thereupon received in evidence, the same having heretofore been marked Exhibit 46.)

Mr. Hart:

We would next like to offer three orders of the Commission, pro ration orders, dated, respectively, August 26, 1935, February 24, 1936, and March 23, 1936. We have only one copy of these and we would therefore like permission to withdraw the originals and substitute copies.

The Court:

You are just offering these for the purpose of the record or are they supposed to have some actual pertinence to the matter that might influence the Court in some way?

Mr. Hart:

I think they have some pertinence.

570 The Court:

Do you wish to state those?

Mr. Hart:

I would like Mr. Pollard to state those.

The Court:

I don't want you to go into great detail, but I would like to know the general nature of them:

Mr. Pollard:

The August 26, 1935, order, your Honor, was the order which contained a recitation that an acreage times po-

tential order for prorating oil on a ten acre unit of spacing had been presented to the Commission and considered by it. It likewise discussed a portion of the decision in Brown vs. Humble Oil & Refining Company with respect to the ability of engineers to ascertain with a reasonable degree of accuracy the oil content. It makes an administrative finding, based upon all of the testimony and expert witnesses which they had heard at their various hearings, that it is impossible for them, the Commission, to ascertain with that reasonable degree of accuracy necessary to allocate this order on an acreage—on a basis of acreage times potential as suggested. It further provides in there that they have made an administrative finding from the evidence that the more wells that are drilled the greater will be the ultimate recovery of oil and gas from any given pool.

Mr. Moody:

What is that date?

Mr. Hart:

August 26, 1935.

Mr. Moody:

Your Honor, I didn't know what the order was about. I object to it because it is hearsay and self-serving and immaterial and irrelevant to any issue involved in this case.

571 The Court:

I should think it would be admissible as an order. It wouldn't be admissible as proof of any of the facts.

Mr. Hart:

We are offering it for the purpose of showing the findings that have been made by the Commission and the orders entered by the Commission.

The Court:

It doesn't follow, of course, that those facts are true, but I think it is admissible to show that an order of that character has been made.

Mr. Moody:

I am going to object to it, your Honor, if offered for the purpose of showing that an order of that character has been made. I object to it in this case because in this case it is self-serving and then I object to it altogether and for all purposes if it is offered to prove the truth of any of the facts therein recited or for the purpose of showing that there was evidence to support them.

The Court:

I think that objection would be good, if it is offered for that purpose.

Mr. Pollard:

It was just offered, your Honor, to show the finding that is made and the administrative finding made by the administrative body in pursuance to the hearings which it had held with these matters at issue and dealing with its spacing rules. There has been some contention made that this is an arbitrary ten acre spacing limit. This order goes to show, as well as does the development in the field, that that isn't what it is at all.

The Court:

I think the Courts frequently consider the various orders they have made and the steps they have gone through in trying to arrive at some equitable way of doing those things. They are admissible for that purpose. Still, on the other hand, if you are offering this order for the purpose of proving the truth of those recitals I don't believe that is admissible.

Mr. Pollard:

No, sir, we are just introducing them to show the administrative findings of the Commission.

Mr. Moody:

I object if he is offering to prove the administrative findings. I think they are immaterial to show the order is made, but certainly they are not admissible to show the findings.

The Court:

I will admit this for the purpose of showing such an order was made and I will make the statement that so far as this Court is concerned I wouldn't consider it as proving as true the facts it purports to find.

(The above referred to instrument was thereupon received in evidence, the same having heretofore been marked Exhibit 47.)

Mr. Pollard:

The second order, dated February 24, 1936, contains a recitation to the effect that whereas in their previous order dated August 26, 1935, there was contained the following language, and they quote it, "We further find from the evidence the more wells that are drilled the greater will be the ultimate recovery of oil and gas from any given pool." And then they proceed thus: "By this language the Commission did not mean and did not find from the evidence that the closer wells are drilled the greater will be the ultimate recovery of oil and gas from any given pool, but by such language only meant and found from

the evidence that the more wells that are drilled

572 in conformity with the spacing rules as applicable to the various fields in Texas the greater will be

the ultimate recovery of oil and or gas from any given

pool." This order further recites, "It was not then the



intention and it is not now the intention of the Railroad Commission to abrogate or abandon any of the spacing rules now in effect and applicable to the various oil and gas fields in Texas, nor to militate against the fact basis on which the Commission's spacing rules are based."

The subsequent order of March, the date being March 23, 1936, again contains that same recitation. In explanation, if it may bear some light on it, my interpretation is that there had been some question of the unrestricted-more wells more oil proposition. The Commission apparently by the second order—at least it is our purpose in introducing it, and our position by the second order is that the Commission applied that finding to the spacing rules with their exceptions as applicable to the various oil fields in Texas, including the East Texas field.

Mr. Moody:

We have a different understanding of it. I take it that this is not the time to discuss our understandings, or does the Court want to hear our understanding?

The Court:

No, I don't want to hear your arguments now.

Mr. Pollard:

If the Court please, I would like to get these marked, and these happen to be my personal certified copies; and we will substitute other copies that are exact and get the Court reporter to mark these.

574 The Court:

What is the pertinency of these orders? Are they supposed to throw some light on the construction or application the Commission gives to the present order?

Mr. Pollard:

Yes, sir. The contention has been repeatedly made by the plaintiffs in this suit that the spacing rule is a minimum spacing rule, that is, one providing for arbitrary minimum limits below which wells could not be more densely drilled upon tracts of less than ten acres. The Commission's interpretation and findings with respect to it show to the contrary. The field itself shows to the contrary; and it is for that purpose, to let the Court see for itself the Commission's findings and interpretation of its own orders.

The Court:

All right.

(The above referred to instruments were thereupon received in evidence and marked Exhibits 48 and 49.)

Mr. Hart:

We next wish to offer in evidence the orders of the Railroad Commission on the application of R. M. Wood on a one acre tract. I offer these for the purpose of showing the action of the Commission on these. There has been a good deal of talk on this and we offer them.

The Court:

Substantially what are they?

Mr. Hart:

They show that the application of R. M. Wood for a permit, on that the Commission finds that it should be granted to prevent confiscation of property; under the exception to Rule 37 he is granted a permit to drill his well on his one acre tract. Then there is an order on a motion for rehearing filed by the Shell Petroleum Company on which the Commission granted a rehearing and then

there is an order reaffirming the permit which  
 575 had theretofore been granted to Wood to prevent  
 confiscation of his property.

Your Honor, I have a schedule showing the density of  
 Wood's tract as compared with the surrounding leases.  
 There has been some testimony—

Mr. Moody:

I object to that because I don't know who prepared that  
 or anything on earth about it. "Sun Oil Company's Exhibit  
 2." I object to that, your Honor, because that is hearsay.  
 It is just simply something that someone filed in that  
 case. It purports to be a representation of their conten-  
 tion of certain facts.

Mr. Pollard:

If the Court please, that was introduced by the pro-  
 testant Sun Oil Company at the hearing before the Rail-  
 road Commission on Rowan & Nichols' application and  
 introduced without objection at all from the applicant  
 Rowan & Nichols and constitutes a part of their file on  
 their application for Well No. 6, and was otherwise sup-  
 ported by the attached plat which was certified to.

Mr. Moody:

If it is offered as something that is in the files of the  
 Railroad Commission I object to it because it is imma-  
 terial. If it is offered to prove the matters therein stated  
 I object to it because it is hearsay.

The Court:

Sustain the objection.

Mr. Hart:

Note the exception. We offer these in evidence. They  
 have been identified.

(The above referred to documents were thereupon received in evidence, the same having been heretofore identified as Exhibits 43, 50, 51 and 52.)

576 Mr. Hart:

Now, if the Court please, there has been some evidence which has been elicited from the witness Hudnall by questions from the Court about the top allowable in the field. I understood from statements made by counsel for the complainant and by complainant's witnesses that the top allowable of the field had not been questioned. For that reason we have not put any evidence on with reference to that.

The Court:

I think you are right about that. I think Mr. Rowan testified himself he was not objecting to the top allowable. But I raised the question myself because it is a pertinent question in any of these cases. As a matter of fact, it furnished most of the litigation to begin with, the question of the top allowable, the question as to whether it was really a conservation measure or whether it was made to meet the market demand. Now, if it is a question that has come to rest and nobody controverts it any more, that may be another story, but if as a matter of fact this arbitrary top allowable as fixed has no reasonable relationship to the prevention of waste then to my mind it becomes very material in regulating these people here.

Mr. Hart:

I may say that if it is considered by counsel for the complainant and by the Court to be an issue in this case or grounds of attack on the order of the Commission we are prepared to sustain the order on the ground that it is a waste prevention measure. On the other hand, if it is not an issue—

The Court:

I would be willing to abide by what they say, whether they tender it as an issue. I raised the matter myself. I don't know whether they are raising that question or not.

577 Mr. Hart:

I don't understand that it is raised by the pleadings. If it is I would like to put on evidence about it.

Mr. Moody:

Your Honor, Mr. Rowan I think stated our view, or rather the position of the lawsuit. He testified he was not attacking in this lawsuit the 522,000 barrel allowable, and that is the testimony that Mr. Rowan gave, and our pleading, I don't think, attacks it. The pleading attacked the method of distributing that allowable.

Mr. Hart:

All right, with that explanation then we understand it is not an issue, the top allowable is not an issue, and we won't offer any evidence on that. The defendant rests.

(At this time a recess was taken, at the conclusion of which the following proceedings were had:)

578 E. V. FORAN, a witness for the Complainant, having been first duly sworn, testified on rebuttal as follows:

### Direct Examination.

Questions by Mr. Moody:

Q. State your name, please, sir.

A. Mr. E. V. Foran.

Q. Where do you live, Mr. Foran?

A. At San Antonio.

Q. What is your business?

A. Consulting petroleum engineer.

Q. Please state your educational training and experience as a petroleum engineer.

A. I am a graduate of the University of Idaho, 1921, in mining engineering, and from June, 1922, to June, 1924—1925, correction—was with the Mid-West Refining Company in the Salt Creek Field, Wyoming, in general production practice, both gas and oil and gasoline plant work, and in 1925 and 1926 with the United States Bureau of Mines in the Rocky Mountain Division, Salt Lake Field, Wyoming, supervising the Bureau's activities regarding conservation on the public domain, of which the entire Salt Creek Field was a part of the domain. From August 26th to the present date a resident of Texas, in which time my profession carried me through the Panhandle Field—

579 Q. Pardon me, August 26th, you mean August, 1926?

A. August, 1926, correction. At which time my work carried me into the Panhandle Field on well completions and production practice, both oil and gas. Since that time in practically every major field in Texas at some time or another on production practice, well completions and conservation work. In general production practice, including appraisal work and reports and examinations for both development and production.

Q. Mr. Foran, you have been here in the Court room and heard the testimony in this case, have you not?

A. Yes, sir.

Q. Mr. Foran, it has been the contention of the defendant in this case, as I understand, that although at the present time the order may be operating—first, before I ask that question, you are familiar with the present plan of proration as it is applied and enforced in the East Texas Field, are you not?

A. Yes, sir.



Q. As I understand, it is the defendant's contention that even though that plan may at present operate to prevent Mr. Rowan or Rowan & Nichols recovering from their lease, the one described in this evidence, in proportion to the amount of recoverable oil under their lease, or to enjoy an opportunity along, equal with that enjoyed with other operators in the field to recover the recoverable oil or its equivalent, that although that may be happening at this time, nevertheless that time will take care of that situation and ultimately Mr. Rowan or Rowan & Nichols will from their wells on their Todd lease recover the equivalent of all the recoverable oil under the lease, that the time element will even the thing off. You have heard that theory?

580

A. Yes, sir.

Q. Is it your view that if there is any disadvantage being suffered at this time by Mr. Rowan or Rowan & Nichols, that time will take care of that so he will ultimately recover the equivalent of all the oil under the Rowan & Nichols Todd lease?

A. No, sir, time in the future will not take care of that situation.

Q. All right, sir. You saw the Plaintiff's Exhibit No. 12, did you not?

A. Yes, sir.

Q. Presented by Mr. Buck?

A. Yes, sir.

Q. Mr. Foran, will you step to the blackboard there and illustrate for us and explain why in your opinion the time element will not take care of the disadvantage that we contend that Rowan & Nichols, the Rowan & Nichols lease has suffered?

A. Yes, sir, I will produce an approximate sketch of this for the purpose of illustration rather than precision.

Q. You are referring to Exhibit 12?

A. Yes, Exhibit 12, which is a cross section diagram of the East Texas Field from a point to the west edge of

the field to the west of the Rowan & Nichols lease to a point to the eastern-most part of the field east of the Rowan & Nichols lease. This horizontal lower line represents the minus 3,320, which was the indicated initial water table in the East Texas Field. The section 581 enclosed by the irregular line above that represents a cross section area which is somewhat similar to the drawing, but not exactly. For purposes of illustration, however, I believe it will indicate. If the cross section be divided into twelve equal units. Now, there are twelve—divided into twelve segments whose horizontal distance or horizontal measure is the same, but whose vertical measure, is variable, and therefore, the cubical content would vary proportionately. If the displacement force from the field is working—displacement force from the field is working from the west to the east at low rates of flow or low rates of displacement the water table will slowly rise as oil or other fluid is taken out from the levels above the water table, and at very low rates of take, such as the East Texas Field is subjected to today, that water table rise will be reasonably horizontal. It may have local irregularities, but if you take the large areas across the field the mean rise of the water table will show somewhat proportionate to the oil displaced, because of the reason that pressures are practically constant in the face of taking some 522,000 barrels per day out of the field for five days, and we come to the fact that those displacements are taking place at almost constant pressure, which indicates that the displacement is taking place of practically the same order as that of which the oil is being taken out, and under such conditions in a field whose sand is permeable on an average as this one the water table rise on an average will be horizontal. It is true that local irregularity may cause local rises, but the mean effect is a somewhat level displacement. Then if we take 582 the water table rise for the time the water has risen to where it is at the top of the sand to the

eastern limit of the first segment, it will represent throughout the pool a displacement of something of that character, in which I have shaded in solid chalk. Under those conditions the oil, or substantially all of the oil in the first segment, underlying that surface acreage, has been entirely displaced by the water, but the second segment still has some left. The third has some more, and so forth, until you get to a point to where it is at the base of the sand, where the water table intersects the base of the sand, which is in the eastern side of the field. From there on to the eastward no displacement by water has taken place and consequently no depletion will have taken place. If pressures are constant or if pressure drops somewhat negligibly any degree of depletion is slight as compared to the original oil in place, and the original recoverable oil in place is there, or its equivalent.

Q. Now, in the meanwhile while this first segment is being drained out if you have a per well allowable, each well allowed to draw practically the same, the wells here and the wells here have all been getting the same amount of oil?

A. Yes, sir.

Q. But this fellow's well is gone and this fellow has some left?

A. Yes, sir, from this point eastward no depletion has taken place. From this point westward total depletion has taken place. Intermediate points, intermediate percentages of depletion or its equivalent have taken place.

On further continuing the process, by the time  
583 the second segment, third, fourth and the follow-

ing segments, as they are also displaced by water, all properties to the westward of the eastern limit of the water are suffering a certain amount of depletion, while those to the eastward of that limit will still be suffering no depletion, although each one of them gets the same quantity of oil, and so on as the water rises upward to the following segment and as it does so those segments to the

eastward are still empty or free from any depletion while those to the westward as far as this point have suffered total depletion, and the amount that each segment will make over an equal area will depend on how much to the eastward or the westward they are to that medium point or neutral point which determines whether or not the amount of recoverable oil is greater or less to the original recoverable oil in place, and as depletion continues on the sum of the total recoverable oil can be calculated from the relative volumetric ratios of these areas. Knowing their original ratios and the fact they get the same amount of oil out during a time period, it becomes obvious that progressing on to the eastward the time factor is in favor of those to the eastward and against those to the westward. In stating the rate of displacement it may be at half this rate, which will take double the time for recovery, or any other variation of rate, but that would not alter the manner or sequence in which the displacement takes place, and knowing the total amount of oil that may be recovered or that will be recovered from each of these segments under those conditions it easily becomes determinable whether the sum total recovered equals more or less than the initial oil in place, and in the case of the Row-

584 an & Nichols lease it indicates that the ultimate recovery would be less than that which was originally in place, were the present method of allocation in the East Texas Field to continue of the same order.

Q. Now, Mr. Foran, let me ask you a few questions. That is simply the application of physics to a physical fact existing in the East Texas Field?

A. Yes, sir.

Q. Of principles of physics?

A. Yes, sir.

Q. If you are letting these areas produce equally this area gets, until it is drowned out, we will say, a hundred barrels of oil a day, and this one a hundred?

A. Yes, sir.

Q. This one is drowned out which was getting a hundred, and this one continues to get a hundred?

A. Yes, sir.

Q. And that is an illustration of the migration to the east?

A. Yes, sir.

Q. There is a zero line through here, we will draw it here, let's call that zero; somewhere in that field there is a line west of which they lose oil and east of which they gain oil?

A. Yes, sir.

Q. Under proration?

A. Yes, sir.

Q. You didn't prepare this drawing or make the calculations, did you?

585 A. No, sir.

Q. You have been over it?

A. Yes, sir.

Q. You know the principle upon which it was worked out?

A. Yes, sir.

Q. And you have illustrated that in your testimony before the Court with your diagram?

A. Yes, sir.

Q. From your study of it you take it to be approximately a correct representation of the facts that indicate the life of the field?

A. Yes, sir.

Q. I believe that shows the Rowan & Nichols tract in an area that will lose approximately eighteen percent or twenty per cent of the oil in place?

A. Yes, sir.

Q. Under this present plan of proration?

A. Yes, sir.

Q. So this thing they call the time factor, then, will it or not, in your opinion, take care of the present disad-

vantage that Rowan & Nichols, the Rowan & Nichols lease is suffering under the existing proration order?

A. No, sir, not under the existing order.

Q. Well, I don't believe—I have assumed that it was suffering a disadvantage. Is it your opinion that the Rowan & Nichols Todd lease, under the existing order, is suffering a disadvantage as compared with other leases in the field in the opportunity which this order and its application gives to that lease or the wells on that lease to produce the recoverable oil under that lease or the equivalent thereof?

A. Yes, sir.

Q. You believe it is suffering?

A. Yes, sir.

Q. You think that the application and enforcement of this order against the Rowan & Nichols Todd lease deprives them of an equal opportunity with other operators in the field to recover the recoverable oil or the equivalent thereof, under their respective leases?

A. Yes, sir, I do.

Q. You think that this order as it is enforced and applied against Rowan & Nichols deprives Rowan & Nichols in the operation of their wells on the Todd lease, prevents Rowan & Nichols recovering their proportionate share of the recoverable reserves in the common reservoir?

A. Yes, sir.

Q. Then they are suffering a disadvantage all around?

A. Yes, sir.

Q. In your opinion are the five wells that Rowan & Nichols have on their lease, the Todd lease, if they were given an equal opportunity with others, in your opinion would the five wells be sufficient to drain the oil under their lease?

A. Yes, sir, I believe they would.

Q. That is if they had an equal opportunity with other operators in the field?

A. Yes, sir.



Q. And would it cause waste, the fact that they only had five?

587 A. No, sir.

Q. Now, this present order that they said is based upon potential or potential method of allocating the field allowable amongst the wells, do you think that that method of allocating the allowable or prorating it among the wells or allocating it among wells, do you think it is a true potential method or—I will state it this way: is the Commission accurately applying a true potential method in the production of this field?

A. Not to all wells, no, sir, not except to a very minor extent.

Q. Well, now, if the Rowan & Nichols lease is given, allowed to produce on its true potential, have you calculated about how much it would be allowed to produce daily?

A. Yes, sir, I have.

Q. How much?

A. If they were allowed to produce daily an amount of oil proportionate as their daily potential bears to the field's daily potential, they would be allowed to produce 160.7 barrels daily.

Q. Instead of that they are producing about 111?

A. 112, I believe it is, approximately.

Q. Now, when you say that you are talking about the potential the Railroad Commission gives them as shown on the map?

A. Yes, sir, as shown on the potential schedule.

Q. They are getting about 49 barrels less than what they are entitled to if they were applying a true potential factor of allocating field allowable amongst wells?

A. Yes, sir.

588 Q. Do you think that if that—if the plan they are now applying, as it continues through the years, do you think that will—you say it is now injuriously affecting Rowan & Nichols as compared with the opportunities others have?

A. Yes, sir.

Q. Do you think that injury will grow less or increase as time goes on? What is your estimate of that?

A. Well, I believe the injury will increase as time goes on.

Q. All right, now, Mr. Foran, do you think that a potential test taken on the Wood lease, the Wood tract of one acre, and a potential test taken on one of the wells drilled on the Rowan & Nichols twenty-five acre tract, would reflect anything about, just—just the potential alone, reflect anything about the relative amount of oil under the two tracts?

A. No, sir, it would not.

Q. You would have to take acreage into account?

A. I think you would if you are dealing with a quantity of oil.

Q. And you would have to take sand thickness into account, would you not?

A. Yes, sir.

Q. Now, Mr. Foran, in your opinion can the wells in the East Texas Field be reduced to say ten barrels per day without creating waste or damaging the wells or causing premature abandonment of the wells or causing the loss of oil that otherwise would be produced?

A. I would. Yes, sir, they could.

Q. Mr. Foran, in your opinion, can a method of pro-rating—

The Court:

Pardon me, what was that last question? I would like to get that.

589 Mr. Moody:

Whether or not in his opinion the wells in the East Texas Field could be reduced to ten barrels a day without causing damage to the wells, premature abandonment of the wells or the loss of oil that otherwise would be produced.

The Court:  
All right.

Q. And I add to that waste, do you think it could be done without waste?

A. Yes, sir.

Q. Mr. Foran, in your opinion, can other methods than the one now applied by the Railroad Commission be adopted for prorating or allocating among wells in the East Texas Field the daily allowable that will not result—that will reduce the inequalities that result from the enforcement of this present order as those inequalities affect Rowan & Nichols?

A. Yes, sir, I believe so.

Q. Are there one or more ways that you think could be adopted? I don't care to go into it.

A. I think there is more than one, all right.

Q. Of allocating the oil that would give the operators a more nearly even opportunity to recover the oil underneath their leases, or the equivalent of it, and would reduce, if not do away with, the inequalities that such persons as Rowan & Nichols are now suffering under the present order?

A. Yes, sir.

#### Cross Examination.

Questions by Mr. Hart:

Q. Mr. Foran, I believe you testified that if Rowan & Nichols were allowed a daily allowable of—in the proportion that their potential bore to the potential of the field, that they would be given a daily allowable of 160.7 barrels, is that correct?

A. That is approximate, yes, sir.

Q. Their present allowable is about 111 barrels a day, isn't it?

A. That is right, 111 or 112, yes, sir.

Q. And if they drilled a sixth well that they have been given a permit to drill their allowable will be increased to 133 barrels, would it not?

A. If they drilled another well it would, yes, sir.

Q. Now, in figuring this 160.7 barrels a day did you assume that there would be no marginal allowance or did you assume that there would be a marginal allowance of a certain amount, or did you just distribute the whole total potential in the proportion their potential bore to the whole field?

A. I based it on a ratio of their potential to the total field potential.

Q. Yes, sir.

A. Purely on a potential basis only.

Q. Purely on a potential basis only?

A. Yes, sir.

Q. And that would give them that 160—that would give them only 160.7 barrels per day?

A. Yes, sir, that is right.

Q. Now, assuming that they had six wells, that is that they drilled their sixth well, and they had an acreage density of one well to about 4.16 acres, which is somewhat greater density than the average of the field, I believe that has been testified?

591

A. Yes.

Q. And you took in account acreage times potential in allocating the allowable, then by reason of the fact their density is somewhat greater than the density of the field as a whole, they would get a somewhat smaller allowance per day, would they not?

A. Just offhand I couldn't tell you.

Q. Wouldn't that follow from the fact their density is greater than the density of the field, that is, that they have fewer acres per well than the field as a whole?

A. Not at all, no, sir. I wouldn't say. It seems to me if they drilled another well their potential would increase at the same time their density decreased, and I did cal-

culate the acreage times potential against the other and found them almost identical, and therefore I say that, without calculating it, just as an approximation, that there would be no difference and I would just consider it an unnecessarily drilled well and would neither add to nor detract from the present situation.

Q. You don't mean if they drilled another well they wouldn't get a higher potential, a higher allowance under the present scheme of proration?

A. They would, but less than if they were on a straight potential at the present time.

Q. Now, Mr. Foran, I would like—

The Court:

Would the fact that they drilled another well arbitrarily give them so much more allowance? What would happen to your top allowable then?

Mr. Hart:

Yes, it would give them more under the present system of allocation.

592 The Court:

Wouldn't that affect the top allowance?

Mr. Hart:

The drilling of one well and the allocation of more allowable to that one well would increase the total allowable in the field.

The Court:

And the total allowable is fixed?

Mr. Hart:

From month to month by the Commission, yes, sir. And I might say in accordance with the findings that the Commission makes with regard to the amount of oil that can

be produced and still keep the pressure from dropping at too rapid a rate.

Q. Mr. Foran, I would like to ask you one or two questions about this diagram you have drawn over here. How far is it, Mr. Foran, from the western edge of the field to the eastern edge?

A. I beg pardon?

Q. How far is it from the western edge of the field to the eastern edge?

A. If I know the approximate scale of one of these maps—what is it approximately, eleven miles across here?

Mr. Cottingham:

Eight and a half.

A. Approximately eight and a half miles.

Q. That will be satisfactory, I don't care to have it exact. About what is the distance from this line up to the highest point on the structure that you have there?

A. I believe 130 feet, I believe 130. By that I mean the highest contour on it. To the water table is 130 feet, I believe, as shown on the contour maps. 3,350 feet, the top contour, minus 3,220, it is 170 feet then, approximately 170 feet.

593 Q. Well, in rising from the present level—is that the present indicated level or the original?

A. That was the original, minus 3,320.

Q. The water will have to travel upward 170 feet, and in order to get to the east edge of the field it will have to travel eastward about eight and a half miles, is that right?

A. Its upward movement automatically carries it eastward. I wouldn't say it would have to carry it that far, because it is already here at this position about halfway across. I say approximately, from here to over there.

Q. Now, I don't suppose it would make any difference in the ultimate result, of course, but this map is drawn,



this sketch is drawn on an entirely different vertical scale from horizontal?

A. Yes, sir, it is an exaggerated vertical scale.

Q. It greatly exaggerates the difference in the levels of the Woodbine sand?

A. Not in proportion.. It does in scale, but not proportion.

Q. Actually if you drew them to the same scale the East Texas Field would be a very thin scaly line like this?

A. That is right, yes, sir.

Q. Now, Mr. Foran, your testimony—this is one of the facts which is brought out by your testimony, is it not, that there is a certain advantage of position which the persons who own tracts on the eastern half of the field, of the East Texas Field, have over persons who own tracts in the west half of the field, under the ratable system of taking from the field?

A. Yes, sir, that is true.

594 Q. Would that same advantage, in your opinion, exist under unrestricted—under conditions of unrestricted production?

A. Yes, sir, but of a different order. That is inherent.

Q. If the Railroad Commission didn't do anything, let them drill and produce as they wanted to, unrestricted conditions, the position on the structure would still have to be considered in determining how much oil would be produced from a lease, is that correct?

A. That is true, with one exception, because of the great thickness of the sand in the fairway they would probably pull on wells with high rates of flow without sustaining injury, whereas thinner sections close to the edges would not be so fortunate. The fairway would have the advantage. It is merely a magnitude of the relative advantages, but the principle is the same.

Q. The principle is the same?

A. Yes, sir.

Q. Now, if you were going to let the men in each segment recover the recoverable oil in place in their particular segment without losing any oil at all to the sections to the east, could you do it in any way without, say, closing off the field all except a certain sector and letting the wells in that sector draw all of the wells' oil?

A. That is true, that would be the only way to do it.

Q. That would be the only way?

A. Yes, sir.

Q. Now, Mr. Foran, this illustration ignores, does it not, the differences which may exist in the structure and which would prevent the even and regular horizontal rise of the water table in the East Texas Field?

595

A. Would you say that again, please?

(The reporter thereupon read the last preceding question.)

A. I would not say taken as a whole across the field. No, sir. I think that it illustrates the manner of displacement.

Q. Doesn't it assume this, that say that the field, if there is no drainage except from west to the Rowan & Nichols tract?

A. This does not—I don't understand you.

Q. Maybe I can make my point plainer. Let's look at this map here, this structural map here. By reason of the fact that this particular area here in which the Rowan & Nichols tract, I believe, is about on the edge, by reason of the fact that it is a high point and that lower points are around it to the north and west and the south, will there not be drainage by reason of the water drive to that area from the north, northwest, west, southwest and the south?

A. I think so, I think there will be displacement across there from any places or directions of higher existing

pressures, whether it happens to be north, south, east or west, as long as those areas maintain pressures higher than those on the Rowan & Nichols; I would say the gradient would be in that direction.

Q. Then they are more favorably situated, not only than the tracts to the west of them, but also more favorably situated than owners to the north and south of them, are they not?

A. Not appreciably so, not in proportion to their thickness here. In proportion to the thickness there I would say they have a better tract of land and therefore  
596 are entitled to recover more oil than those sections.

Q. I don't think I asked you that question, Mr. Foran.

A. I thought you asked me were they more fortunately situated. I said yes, sir, because they were higher and more oil than these others; I think so.

Q. Now, when you speak of a man having a better tract of land do you take into consideration only the thickness of the sand under his tract, or also take into consideration his position on the structure and position in the field?

A. Yes, sir, I take the position on structure and in field in addition.

Q. In other words, any allocation that would disregard natural advantage on structure would disregard a factor you consider an element in valuing a man's land?

A. Yes, sir, I think position on structure is an element contributing to the value of his land, yes, sir.

Q. Now, Mr. Foran, let's look at this chart over here again a minute. I believe that there was some testimony by Mr. Buck that the indications are that instead of the water level rising horizontally in this fashion, as you have drawn these lines, that the water level is rather tilted in somewhat, this manner and is rising along this way, gradually rising higher as it goes along the bottom of the Woodbine sand. I understood that to be the manner in which he said the water level would rise.

A. If it would rise that way you would expect it to be higher water on the east and lower on the west.

Q. If it rose in that way would or not the disadvantage that you are speaking of to the Rowan & Nichols lease be decreased rather than increased?

597

A. I say it would still be decreased.

Q. The disadvantage?

A. I beg your pardon. You asked me would the proportion of the disadvantage be decreased or increased?

Q. Yes, if it would go somewhat like this. Have you figured that out?

A. They would still have the same relative disadvantage as before.

Q. That wouldn't make any difference?

A. No, because those to the east and west of them would bear the same relationship to this inclined table as to the horizontal table.

Q. Now, supposing you find in the east edge of the field here not permeable sands but by reason of the fact of certain facts that are indicated by certain information you have that these sands over here to the east are relatively impermeable and for that reason this pressure is not transmitted to them and the wells on the east side of the field go out of production before the wells here in the center of the field. Would that not indicate the disadvantage that you are speaking of under this situation where the sands are relatively uniform would not exist in the case of the Rowan & Nichols tract?

A. Well, I can't—I can't assume—I can't conceive of good permeable sands which are connected to the main pressure reservoir, the common reservoir, going dry when they are constantly being displaced by a medium of the same type of liquid to the west of them.

Q. Would you answer my question on the hypothesis that I gave you, or do you say you can't answer on that hypothesis?

598

Mr. Moody:

Mr. Hart, I suggest you let him answer your question. He said he couldn't conceive of that condition existing.

Q. Could you answer that on that hypothesis or not?

A. That was an assumption?

Q. Yes, sir.

A. Assuming that these sands were too impermeable to allow the liquid to come into it?

Q. No, that it was so impermeable that the pressure was not transmitted over there and this area goes out of production.

A. That is the same. If that is your assumption, then my answer is yes, they would not be replenished, if they could not maintain their pressure I mean.

Q. All right, and then this portion of the field where the thick sands and permeable sands are located would be the last portion of the field to produce oil?

A. Well, how far out are these impermeable sands from the east side, are they just on the outside?

Q. Don't ask me questions.

A. No, I am very willing to answer every question, but I can hardly assume that these impermeable sands are anything like—anything other than rather a border on the east half.

Q. I am just asking you for information, Mr. Foran. I don't know how far they extend, but I am assuming, in accordance with some of the testimony, that that portion of the field will go out of production; then if we assume that then it will follow, will it not, that the portion of  
599 the field west of that where the permeable sand exists will produce longer than any other portion of the field?

A. If you are speaking through the Gladewater and Rowan & Nichols lease I say the gradient is very flat, and therefore cannot concur with your assumption.

Q. Now, Mr. Foran, I believe the evidence is that this lease is producing, has produced about 358,000 barrels of oil up to the present time?

A. Yes, sir, I believe that is it.

Q. And the water level has risen only ten feet. Is the rise of the water level in proportion to the amount of oil withdrawn?

A. I would assume that it must be, since those pressures are maintained.

Q. Well, the Rowan & Nichols has withdrawn from about a fourth to possibly a third of what was estimated to be the recoverable reserves under the lease?

A. That is true, yes, sir.

Q. That is at the present rate of withdrawal. Now, how long will it take the water level to get up to where it will drown out the Rowan & Nichols lease, at the present rate of withdrawal, if it has risen about ten feet in the past eight years?

A. You mean how long will it take to rise to the top of the sand under their lease, completely displace it or merely enter it?

Q. Put them out of production.

A. Clear to the top of the sand where the displacement is complete? I believe they are some 130 feet above the water table, the top of the sand.

Q. I can't answer your question.

600 Mr. Moody:  
3,180 is the top.

A. That is 130 feet—140 feet, and if it has only risen ten feet it will rise another 130 feet.

Q. At the present rate of total withdrawal?

A. Sir?

Q. At the present rate of total withdrawal from the field how long will it take the water to rise and drown out the Rowan & Nichols lease?



A. I couldn't calculate that for you right offhand because the area covered by the water under the field increases as time goes on and its rate of rise may vary for that reason.

Q. Could you estimate the time it would take for the water table to rise up to the Rowan & Nichols lease?

A. Well, I would say that as time goes on, due to the fact that the oil producing area of the field becomes lessened and lessened for the same amount of oil withdrawn, the water table, the rise would accelerate, and offhand I couldn't give you a figure, but as the acreage shrinks for the same displacement the water table will rise faster.

Q. You couldn't tell us exactly what that would be, of course. I believe you said that. Mr. Foran, let me ask you just one more question. When you calculate the recoverable reserves of a lease do you calculate those reserves on the basis of the amount of oil within the confines of the lease, if they were extended down into the earth, or do you count on the structural position of the lease so that it will drain some oil from surrounding leases?

A. If I am calculating the reserves in place  
601 I am calculating only the reserves underlying the acreage, that is, the reserves in place.

Q. Well, now, has the water level gotten to the Rowan & Nichols lease?

A. No, sir, not to my knowledge.

Q. Do they or not have the same amount of oil in place under their lease at this time that they had when they drilled their first well?

A. Practically the same, very little less.

Q. Very little less?

A. Yes, sir.

Q. Now, Mr. Foran, I believe that there has been some mistakes about the exact position of the Rowan & Nichols lease. Do you know whether it is actually farther to the west or farther to the east of the center of the

line or center of the section of the field in which it is located? You take an east-west cross section of the field here where the Rowan & Nichols lease is located, are they farther—are they on the east or west of a line drawn halfway through that cross section?

A. A line drawn halfway through?

Q. Drawn through the center of this cross section, are they on the east side or west side?

A. Just that linear distance, I would say that—I would say that they are on the eastward of that line as I lay it across there.

Q. They are in the east half of the field then?

A. Yes, sir, if you take a geographical dividing line they are in the east half of the field.

Q. Well, as you pointed out they get drainage from all that portion west of them, which is more than half of the distance across the field at that point, and in addition they get the drainage from the north up—

The Court:

That is repetition.

Mr. Hart:

That is all.

#### Re-Direct Examination.

Questions by Mr. Moody:

Q. Mr. Foran, while you are up there, there has been a lot said about this high, and this pink here is the high, I assume. That line over here, that crosses Rowan & Nichols, east of three wells, they are west of the line, and two to the east of it?

A. Yes.

Q. This is the 3,180 foot contour line?

A. Yes, sir.

Q. As you go on east this keeps getting higher?

A. Yes, sir.

Q. And according to this contour map they have here from the top of the Rowan & Nichols sand over here to the next contour line or to the next high place over there there is thirty feet, it is thirty feet higher over here than it is over here on the Rowan & Nichols tract?

A. Yes, sir.

Q. All right, now, they have talked about these wells being abandoned. Nobody knows of any wells being abandoned over there that have thirty feet of sand in them, do they?

A. Not if it is permeable, no, sir.

603. Q. And no one knows of any that has ten feet that is permeable being abandoned?

A. No, sir. I beg pardon, I make a correction. On the east side—that may be correct on the west side, but if you are speaking of the east—

Q. I am talking of the east.

A. Yes, sir.

Q. Mr. Hart asked you in discussing the diagram to suppose that the sand was impermeable back over there. It is a known fact, is it not, that that is a permeable sand?

A. Yes, sir.

Q. Producing oil out of it every day?

A. Yes, sir.

Q. Have been for seven years?

A. That is right.

Q. With reference to whether there is a third or fourth of the estimated recoverable reserves under the Rowan & Nichols tract which has been produced, that depends on what you figure on, does it not?

A. Yes, sir.

Mr. Moody:

Mr. Hart, when you said a third to a fourth of the estimated recoverable reserves have been produced from the Rowan & Nichols land, you had in mind the lower figures?

Mr. Hart:

According to the estimates Mr. Rowan and his experts have given at different times, yes, sir.

604 Q. Now, Mr. Foran, you were asked, I believe, I asked you if there were other methods of allocating this field allowable among wells that would reduce the disadvantages that the present one causes to some operators, including Rowan & Nichols, and you said there were. I am not undertaking to commit you to any one of them or your honor to commit plaintiff to any one of them, but in order that the Court may have before him something as to what you have in mind, name some of them.

A. You could take potential, times acreage, which would give—which would tend to lessen the prevailing inequities and it would not introduce new errors, because acreage can be determined exactly, and I think these potentials, if you assume they are reasonably correct, but the acreage is exact.

The Court:

Is that East Texas Field so constant that you can be sure the acreage is the same? For instance, a man might have a good well on a large piece of acreage, one part of his acreage have a good well and the balance of the land be no good.

A. Within the confines of the field the density is so fairly well developed—

The Court:

You say you can multiply potential by acreage?

A. Yes, sir. My basis for that is this, if those potential wells are representative of potentials in the East Texas Field, and there are only seventy-one, or one to every 1,800 acres, I would certainly feel I was staying within the bounds of accuracy if I took any acreage within that 1,800 and applied it equally to it, because apparently they are supposed to be representative of 1,800 surrounding acres.

Q. Mr. Foran, if the potential will do what  
605 the Railroad Commission engineers claim it is, that is reflect reserve, if it is accurate for that purpose, one man has one acre here, another man has a hundred here, if you will multiply the potential that they say does reflect, if it does what they claim for it, if you multiply it by the acre here and a hundred here, then taking their own yardstick, that fairly reflects it; doesn't it?

A. That is the only conclusion you could draw.

Q. Isn't that a fairer way to get at it?

A. Yes, sir.

Q. Assuming they are right, say here is a man with one acre and here is one, if it reflects what is under the land, then, potential times the acreage would be a fair way, if they are right?

A. Yes, sir. They reach out to cover 1,800 acres on an average, and assuming that to be uniform, and if we assume potentials reflect reserves, we must assume uniform reserves. Therefore, reserves are directly proportionate to acreage.

#### Re-Cross Examination.

Questions by Mr. Hart:

Q. Well, the potential reflects the productive capacity of the wells?

A. Why, that is what it is, the productive capacity of the wells.

Q. And you measure potential by taking what a well will flow and not the number of acres around a well?

A. Then—

Q. Just answer my question, isn't that correct? Repeat the question.

606 The Court:

Ask the question over again. I didn't hear your question.

Mr. Hart:

The question was, you determine potential by seeing how much the well would produce and not by counting the number of acres around the well, isn't that correct?

A. That is correct.

Q. Now, when you say acreage times potential would reduce this inequity which you spoke of you are assuming that the marginal allowance is eliminated, are you not?

A. No, sir, I believe that you could keep an allowance, a marginal allowance, and still above that marginal allowance apply this acreage times potential factor.

Q. But if you keep the same marginal allowance and only prorated the Rowan & Nichols lease and all other leases on the basis of acreage times potential instead of potential alone, because of their density, the density of their drilling, Rowan & Nichols would not be benefited any more by acreage times potential than by potential?

A. That is if you maintain the same twenty barrel marginal.

Q. And the same total allowable?

A. And spread it over all of the wells who made above the marginal.



Q. No, you keep the same marginal allowance for all the wells that will make that much and the same top allowable?

A. Yes, sir.

Q. The same system now except you prorate the balance above the marginal and allowable on the basis of acreage times potential instead of potential alone, in the case of Rowan & Nichols, by reason of the fact that they are more densely drilled than the average of the field as a whole, they would not benefit by a change from a potential basis of allocation to an acreage times potential method of allocation?

A. Why, if you keep the same margin as you have right now for all wells you have a hundred per cent well system. That is inconsistent. I can't reconcile the reasoning of the question. If you have twenty barrels to every well over there now and the 522,000 allowable you have a ninety-eight and one-half per cent per well right there.

Q. Well, would Rowan & Nichols be benefited or not by the change I have spoken of?

A. I don't know, it would be so close that it would take precise mathematics to tell it.

Mr. Hart:

That is all.

Mr. Moody:

That is all.

The Court:

I have some questions. Let's get down to the question here of whether it is necessary to have the marginal allowance to really produce that field without any loss or waste. What, in your view, is the proper thing to be done with regard to those lame duck wells that can't make very much? Do you have to give them a handicap of the

kind the Commission gives them to properly produce the field? It is a sort of a handicap, isn't it?

A. Yes, sir, it is an inherent proposition that can hardly be overlooked.

The Court:

What is your view about that?

A. Well I think that their marginal in the case—

The Court:

Not with regard to your view or that the man has put his money in it, but looking at it from the standpoint of the public and the idea of preventing waste, have they got to be considered and given this preferred position, or can they be disregarded?

A. No, sir, no more than a dry hole or uncommercial wildcat, because it is evidently a risk and those types of wells are confined to reasonably well known areas in the field.

The Court:

Suppose you treat them so harshly they have to quit. How much will the state lose by reason of that quitting?

A. They would undoubtedly, but—may I answer—

Mr. Moody:

You mean in oil that can't be produced? You are not talking about taxes?

The Court:

I am talking about how much oil would be eventually lost if these weak brothers were disregarded.

A. I don't think they would lose very much. If they are so weak they only produce a few barrels a day in the face of those that produce thousands of barrels—they do not represent a large or any important percentage of the ultimate recovery of the field. I do not think that they

should be major issues in dealing with the rest of the field, as it is, because of their minor importance, but it would not be my recommendation to overlook or to not to grant them an advantage. Wells of that type, there is only a few of them, and I think under those conditions they might be, if for no other reason for it but custom, it would be my recommendation to grant them the advantage.

The Court:

As I understand it, there are 463 of those wells.

609 A. Yes, sir, that is approximately. Some of them are water bearing wells on the west side which I think should be looked at in somewhat a different light than those on the east side. That problem of the marginal well can't be looked at alone from one side. I think it is more intelligent to look at the water wells on the west side with one view and those on the east with another, because their problems are different.

### Re-Direct Examination.

Questions by Mr. Moody:

Q. I believe the testimony was those 463 wells produced approximately 5,000 barrels per day, or one per cent of the total daily allowable, isn't that correct? Do you know, Mr. Cottingham?

Mr. Cottingham:

I didn't understand.

Mr. Moody:

Those sub-marginal wells, 463 or 467 of them, produce about one per cent or a little less than one per cent of the daily allowable?

Mr. Cottingham:

The report I have as of February 1st of this year shows that there were 451 sub-marginal wells which had assigned to them 5,250 barrels, or  $11\frac{1}{2}$  barrels per well.

### Re-Cross Examination.

Questions by Mr. Hart:

Q. I would like to ask a question or two along that line. Now, Mr. Foran, when you consider the marginal allowance you have to not only consider the sub-marginal wells, that is the wells that can't make more than twenty barrels a day, but you also have to consider a marginal allowance for all the other wells up to—

610 Mr. Moody:

Pardon me, I object to that because it calls for a conclusion of law.

Mr. Hart:

I am asking him about the question of waste.

The Court:

He hasn't finished his question.

Q. When you talk about the marginal allowance—it runs up to, I believe the testimony is, within 7,000 barrels of the total allowable of the field, isn't that true?

A. Under the present order, yes, sir.

Q. That is true?

A. Under the present order.

Q. Now, in considering a marginal allowance the present order not only gives a marginal allowance to the sub-marginal wells, but also to the wells that can produce more than that, up to those that can, that have a potential of 860 barrels per hour, isn't that true?

A. Yes, sir, wells up to 860 barrels an hour are considered marginal wells.

Q. That is the point I am making.

A. Is that your understanding?

Q. I thought that is what you said.

A. 860 barrels an hour and marginal wells?

Q. No, I say those are the wells that are included within this marginal allowance, and that comes up to within 7,000 barrels of the total allowable of the field?

A. Yes, but I wouldn't class those as marginal wells, though.

The Court:

You are splitting hairs about a term. He is talking about the effect of the order. Unless they make  
611. more than 860 barrels, as I understand, they get twenty barrels a day.

A. Yes, sir.

The Court:

And those wells that run higher get a proportion of what the weaker ones didn't make, and that is only 7,000 barrels?

A. I considered what you said, sub-marginal, as the margin and the other as the per well.

Q. Now, if you allocated the total allowable production of the field strictly on a potential basis and eliminated any marginal allowable you would not only reduce the sub-marginal wells below, say ten barrels a day, to take your figure, but you would also reduce a great many other wells that were not weak sisters, but that could produce considerably more than twenty barrels a day, you would reduce them below ten barrels a day on that system?

A. If ten barrels is the minimum of any well in the field, no, sir.

Q. No, Mr. Foran.

A. Pardon me. Do you mean a 200 barrel well might be given less than one of the sub-marginal wells? That was my understanding from your question.

Q. No, my question is this, Mr. Foran, if you applied strictly a potential method of allocation to the field as a whole, made no marginal allowance, would there not be a great number of wells that would get a daily allowance of less than ten barrels a day?

A. If no margin or minimum was set?

Q. Yes, sir.

612 A. Yes, sir.

Q. And those wells that would get less than ten barrels a day, would include not only weak sisters or submarginal wells, but include a great many wells that could produce if allowed to do so more than twenty barrels a day?

A. Yes, sir, that is true.

Q. Do you know how many wells under a straight potential method of allocation would be reduced below ten barrels a day?

A. There would be great numbers of them, wells making around 300 barrels an hour or 200 barrels an hour would fall under that list.

Q. And under your estimate of ten barrels a day, if that is the margin below which they can't be restricted without tending to cause waste, then those wells have to go out of production, would they not?

A. Not if you use ten. Right now you drop from twenty to fourteen, you dropped from twenty to fourteen in the last year and nothing went out of production, and I don't think fourteen is a critical setting, I don't think ten is unreasonable.

Q. I say if you assign an allowable to them below ten barrels a day.

A. High powered wells can be pinched below ten barrels and they will still produce if they are not pinched with water.



Q. What would you say is a marginal or minimum allowance below which you can't restrict wells?

A. I think some wells vary between five to ten barrels.

Q. All right let's say five barrels. If you applied a straight potential basis would there be a great  
613 number of wells that would be reduced below five barrels?

A. If you put no minimum on, yes, sir.

Q. And those wells that would be reduced below five barrels would include a great many wells that would actually produce a great deal more than twenty barrels a day?

A. That is true if no minimum was set.

Q. If you did that you would force a great many wells to be prematurely abandoned?

A. No, sir.

Q. If you didn't put a minimum on?

A. I believe in setting a minimum.

Q. You do believe in setting a minimum?

A. Yes, sir.

Q. The question is whether in your opinion do you think there is a—there is any grounds for debate as to whether that minimum should be five barrels or ten barrels or as much as fourteen barrels?

A. Yes, sir, I think that will take some additional thought.

Q. In other words, it is reasonable to set a marginal allowance, say as much as fourteen barrels a day?

A. I doubt if that would give equity.

Q. Do you think there is some reason for saying that is a reasonable marginal allowance?

A. I think it could be set below that without physical waste.

Q. Well, do you think engineers could reasonably differ with you?

A. If I could give my reason maybe it would clarify my answer.

Q. Could you answer my question?

A. I did, I said yes, I believe they can be set  
614 below there.

Q. My question was do you think engineers could reasonably differ about what that minimum could reasonably be?

A. I doubt if they would differ a great deal.

### Re-Direct Examination.

Questions by Mr. Moody:

Q. Mr. Foran, if you applied a straight potential that Mr. Hart is talking about there and some of these good wells, these strong wells, would be reduced below ten barrels a well by that potential?

A. Yes, sir.

Q. That would result from the fact, would it not, some fellow drilled a well on a little bitty tract of land?

A. Yes, sir.

Q. Or else drilled a small tract of land to a very great density?

A. Yes, sir.

Q. As it is being done now are there many or few people over in that field that by reason of having good wells on small tracts of land have produced more oil than ever was under that land and still have years to come on?

A. Yes, sir.

Q. Meanwhile the fellow next to him is not in that position?

A. Yes, sir.

Q. Now, in applying an acreage times potential factor in allocating this allowable could you allow a minimum of so much to the well or a minimum of so much to the lease and thereby reduce the disadvantage that people are now made to suffer as Mr. Rowan here is now suffering under the existing order?

A. Yes, sir, I believe it could be done.

615 Q. Now, then, here if a man has a tract of three acres in that field with three wells on it or four acres with three wells in it, and there are tracts drilled to that point of density over there, are there not?

A. Yes, sir.

Q. Now, do you know of any reason why you could not allow so much to that lease and why a man could not produce it all out of one well and close in the others? I don't mean plug it in, just close in the other wells and await some time until there might be a practical reason for operating those other wells?

A. Yes, sir.

Q. It wouldn't cause waste, would it?

A. No, sir.

Q. It wouldn't injure; be injurious to the well, would it?

A. No, sir.

The Court:

Mr. Hart got very close to a matter I was trying to get to. Is it your opinion that you have to take some notice of these smaller wells, you can't just weed them out?

A. Yes, sir, I believe you have to give them some consideration.

The Court:

Well, I am not talking about it from the standpoint of being nice to them, I am talking about it from a standpoint of whether the state will lose a natural resource if you don't do it. Have you got to take those wells into consideration in any fair scheme to develop that reservoir, or can you disregard them?

616 Mr. Moody:

Without preventing waste, is that what the Court has in mind?

The Court:

Yes, that is what I tried to make clear. I think the only grounds the state has to say to these people, "We are going to interfere with your business one way or another," is that this oil is a natural resource, "We will see you develop it in such a way you don't waste it. It doesn't make any difference to us who it belongs to, but you must not lose it and you must not waste it." Now, starting on that premise, the question that I had in mind—this is sort of thinking out loud—you have an order here that practically puts the field on a per well basis so that any well that can make twenty barrels can make it. If it can't make it it can make as much as it can, and here are a lot of wells that could make more if they were allowed to do so, but they are held back for these handicap people, except for this small amount of 7,000 barrels. Now, what I want to know, is at your opinion as an engineer, in drawing an order to prevent waste is it necessary to take these wells into consideration, these smaller wells that can't make so much, or could you eliminate it? Is the Commission justified in tying everybody else back because of the weak ones? Do I make my question clear to you?

A. Yes, sir. May I make an example, give an example?

The Court:

I want to get your idea. We are talking now, ventilating it among ourselves. You see, when you attack one rule the question comes up, what are you going to put in its place.

A. If I may make an explanation maybe my answer will be understood better. Take an example of a three or four acre tract that might have five or six wells on it. I would say you could shut down on a tract that small all the wells except one and never change it as to physical waste or recovery or anything else. To that extent you could totally disregard them, but to those isolated wells that may be locally dis-

connected from the pool and are weak wells, they would be in a different category.

The Court:

If they don't let them produce there will be oil which will never be brought to the surface?

A. I think so.

The Court:

If you admit that as a premise, how much do you have to let them produce to exist?

A. I think they can produce, exist, on ten barrels a day where they are not in the water area.

#### Re-Cross Examination.

Questions by Mr. Hart:

Q. Where the well is in the water area how much can they exist on?

A. Five barrels a day with a few exceptions. In exceptional cases maybe more. I couldn't say offhand, but in the majority of cases five barrels a day, and ten barrels a day in water area will take care of them.

Q. You mean the marginal will have to be higher or lower in the water area?

A. No, I think the general margin will take care of them.

Q. You say ten barrels for the east side. How much for the west side?

A. The same thing for the west side.

Q. The fact that they are producing water doesn't produce any additional cost?

618 A. Not with respect to physical waste alone.

Q. Premature abandonment of the well, which would lead to physical waste?

A. Premature abandonment is subject to water drive and on the east side I think the condition is entirely different.

Q. If you apply a straight potential method of allocation and have no minimum or marginal allowance then all wells which have a potential of 300 barrels per hour or less would receive an allowable of ten barrels per day or less? Under that method you would eliminate more than just the weak sisters?

A. I haven't figured it out, but it would not be unreasonable to arrive at something of that order. I have not figured it but I can conceive of that being the case.

Q. Then under that method of allocation, if you eliminated the marginal allowance, you not only eliminate these weak sisters but you eliminate wells that would produce 300 barrels per hour. What would that be per day?

A. 7,200 barrels per day, but I do not recommend eliminating a marginal. If I have given that impression I wish to correct it here. I would recommend a minimum.

The Court:

You think there should be a minimum of about ten barrels?

A. I wouldn't say arbitrarily ten barrels.

The Court:

Can they could make it?

A. Yes, sir.

The Court:

And then you take the difference between that and the top allowable and prorate it among the other wells on a basis of acreage or potential?

A. That may be one way, which I believe is more equitable than the present method.

The Court:

Your complaint against this order, then, is that it gives too much to the smaller wells?

A. Yes, sir, my complaint is that they make—



The Court:

I don't mean your complaint, I mean your criticism.

A. Yes, sir, they look at 800 barrels and one barrel with exactly the same eyes, and I can't reconcile myself to an order that makes no distinction between 80,000 per cent difference.

Q. If you took a ten barrel—of course, you have to take into consideration the Saturday and Sunday shut-down, under that the marginal allowance is reduced to about fourteen barrels?

A. That is true.

Mr. Moody:

That also hits one barrel and 860, they each produce only five days.

A. Yes, sir.

Q. It hits all, but if you adopted your figure of ten barrels a day and allowed them to produce seven days a week you treat those that produce one barrel a day and those 300 barrels a day the same?

A. That would be more equitable than the present.

### Re-Direct Examination.

Questions by Mr. Moody:

Q. Mr. Foran, insofar as these marginal wells on the east side are concerned that are producing less than twenty barrels a day, can you put them all in one class and say that to close these wells in would create waste as to every one of them? Isn't each one of them more or less an individual case?

A. A great many of them are, especially there in the southeastern edge of the field, in the southernmost part of the field.

Q. Now, then, the production of oil at the rate of five barrels a day and tremendous quantities of oil along with it, in order—

The Court:

What is that?

Q. I mean water, five barrels of oil and tremendous quantities of water together with that oil, doesn't the production of that water reduce the reservoir pressures and otherwise contribute to waste that is clear out of proportion to the five barrels of oil? Wouldn't it be better to leave the five barrels in the ground and trust that the water would wash it up-structure?

A. Yes, sir, because each barrel of water taken out of the reservoir and brought to the surface diminishes the pressure. Not quite so much as a barrel of oil, but about eighty per cent.

Q. When you consider the question whether or not these wells should be—these little weak sisters, as Mr. Hart calls them—most of them have been strong brothers in their day, haven't they? If you, when you consider these wells, you have to know more about the facts, don't you, than just that it is one of the group of wells, you have to know something about where that well is in relation to others? Some areas might be closed in without the state losing any of its natural resources and others of them maybe ought to be prolonged to see if they can do a little more?

A. Yes, sir, I believe that is right.

621 (Witness excused.)

Mr. Moody:

Gentlemen, I wonder if I could get this: I don't know whether it is in the record or not—I don't think it is—but that the wells over there in the East Texas field producing or having potentials of 200 barrels or more an hour are not pumping wells?

Mr. Hart:

I don't know whether it is true or not.

Mr. Moody:

Mr. Cottingham has figures on how many pumping wells there are over in that field.

The Court:

What is the materiality of it?

Mr. Moody:

Simply that the marginal well law applies only to pumping wells, and the statute says pumping wells shall not be reduced.

The Court:

Is it the contention of counsel on either side that if that marginal well law results in taking a disproportionate amount of the oil from the reservoir for those wells which come under that law and if you are going to put a ton allowable of say 500,000 barrels and these wells that fell under that law ran so high the other wells didn't get their part, would that law be valid?

Mr. Moody:

No, sir.

The Court:

Is the State contending they are bound by that law to accord to all these little wells this twenty barrels and accordingly because they had to give them that much that then they wouldn't give the other wells as much as they might be entitled to?

622

Mr. Hart:

I don't think they could do that.

The Court:

That is not your contention?

Mr. Hart:

No, sir. That situation doesn't arise in this case.

The Court:

There is some talk about that statute and I want to either get it in or out of the case.

Mr. Hart:

They are attacking it in this case, but I don't know that it is material.

Mr. Moody:

We are attacking it, your Honor, and saying as it is construed and applied it is invalid and now they say they don't construe it that way, but they say you produce your oil five days a week. They have two holidays and we divide what you produce by seven instead of five and we are producing fourteen—we are cutting you down to fourteen barrels a day, lower than the marginal well law, but you read their schedule and it says all wells up to 860 get twenty barrels. As I see it that is a subterfuge—and I don't use that word in an offensive sense at all—and in the practical effect of the order they are saying that all of these wells, because of the marginal well law, must have twenty barrels a well, even the little fellows, and thereby cut those down that have a lot more oil, to give these that don't have the capacity but to produce a small amount their oil. Now stripped of all its dressing and looking at the thing as it is, that is what you have, and that is our contention of the way this order construes and applies the marginal well law, and as so applied that law is void because it takes somebody's property without any sort of hearing or process and gives it to somebody else.

623 Mr. Hart:

Our contention is not that you can restrict the better wells to below the marginal wells. We do not have a situation here where better wells are restricted to below marginal wells.

The Court:

Then I suppose we had better have that evidence come into the case by agreement or proof.

Mr. Moody:

What I would like for them to do is furnish me—is have the Railroad Commission furnish me the number of pumping wells in the East Texas field, the number of such wells that make 20 barrels or less.

The Court:

If they have it and are willing to do it that is all right, but I wouldn't require them to get your evidence for you.

Mr. Moody:

No, sir, but they have reports that are made to them and I think we can agree on that. You have that information; haven't you the number of pumping wells in the East Texas field and the number of such wells that made 20 barrels or less per well?

Mr. Cottingham:

We can get that.

Mr. Moody:

Well, whatever the figures are. We will accept Mr. Cottingham's figures on that, if he will furnish us with that. With that matter in the record, the right to put it in later on, the plaintiff rests.

The Court:

Have you any rebuttal?

Mr. Hart:

No rebuttal, your Honor.

(Testimony closed.)

At the close of the testimony, the complainant and the respondents each in open Court moved for judgment on the pleadings and the evidence.

## 624 PROCEEDINGS ON PRE-TRIAL HEARING.

(Title Omitted.)

San Antonio, Texas, January 14, 1939.

(Style, number and jurisdiction omitted.)

625 Be It Remembered, that heretofore, to-wit, on the 14th day of January, A. D. 1939, at a pre-trial hearing in the above numbered and entitled cause, held in San Antonio, Texas, on said date, before the Hon. Robert J. McMillan, Judge, at which there were present:

Rice M. Tilley, Esq., Fort Worth, Texas,

Gov. Dan Moody, Austin, Texas,

Phillip Tocker, Esq., Fort Worth, Texas,

Appearing for Complainant.

Hon. James Hart, Asst. Attorney General, Austin, Texas,

Harry Pollard, Esq., Austin, Texas,

Durward Mahon, Esq.,

Appearing for Respondents.

Whereupon, the following proceedings were had, to-wit:

The Court:

Gentlemen, I was advised in my office that you gentlemen wanted a pre-trial hearing in this matter, and I set it down for this morning, and I will simply say to you



for your information that I know absolutely nothing about this case, or if I did know anything about it I have forgotten it. Maybe you have told me something about it on some prior occasions, but if so I have forgotten what it is. Who is the burden of procedure on here?

Mr. Tocker:

On the complainant.

The Court:

All right, now, what do you want?

Mr. Tilley:

Our complaint is rather lengthy, if the Court please, and of course they have answered, all except one  
 626 amended answer. By the way, we would like to have leave of Court to file an amendment whereby we substitute another paragraph for paragraph ten, which has been examined by counsel for the defendant. They haven't had an opportunity to deny the allegations contained in that paragraph yet, your Honor, but I assume that since they have denied the general allegations that we have made in connection with the subject matter in that paragraph, that they will more specifically deny that supplemental paragraph. It seems to me, unless it will take too much of the Court's time, and in order to familiarize the Court with the issues in the case and the lawsuit, that we might first agree on the documentary evidence, because we know pretty well what that is going to be. I think we will have no trouble over that. Then we can probably agree on the number of expert witnesses we will have and who they will be, so each side will be able to prepare its case accordingly, and then, of course, the issues in the case, if we can agree on those issues, then we might just go ahead and read the petition and in that way familiarize the Court with what the lawsuit is all about.

The Court:

No, I am not going to let you read the petition to me, that is too long.

Mr. Tilley:

I thought maybe you might not, and yet I thought you might want us to read it in order to clarify and trim down the facts, so the Court won't waste any time.

The Court:

It is the custom to state them, usually, a man can state a thing a whole lot quickly verbally than if he puts it on paper.

Mr. Tilley:

I will let Mr. Tocker then, he prepared the complaint, I will let him tell the Court substantially what is 627 in the complaint.

Mr. Tocker:

We complain principally of an order of the Railroad Commission restricting the allowable that complainant may daily produce from its five wells on a twenty-five acre lease located in the East Texas Field. We have described the East Texas Field and have sought to relate certain leases in the field generally, and our wells particularly. We have set up the fact that under the order of the Railroad Commission governing the ratable production from leases in the field generally, and our wells particularly, we are allowed to produce only 2.32 per cent of our hourly potential. We have alleged that the potential is a controlled potential and is taken, is measured by certain key wells in the field; that the potential is taken and contour lines then drawn from these key wells to indicate or measure the potential of the other wells in the field; that that method of proration, that basis of the taking of a potential is fiction, is not fact; that it does not

take into consideration the physical characteristics of the lease, this is particularly the thickness of the sand, position on the structure, the porosity and permeability of the sand, and that it results in a practically per well basis of proration; that we relate certain specific instances where the complainant in this case, with an average of one well to five acres, is allowed to produce no more than adjoining lease owner who has only one well to one acre; that by reason of this plan of proration it does not take into consideration the density of a lease or the acreage that we are losing oil to which we are entitled; that we are losing energy to which we are entitled; that

628 the wells to the east of our lease are receiving our

oil and draining it, and that they are receiving our reservoir energy, by reason of the present plan of proration, and that our wells will be dry long before we will have recovered the oil to which we are entitled. That what we believe we are entitled to is that proportion of the total daily allowable that the recoverable oil under our lease bears to the recoverable oil in the field; that the present proration plan does not give us that, and that for that reason it is void, constitutes a taking of our property without due process of law and denies to us equal protection of the law. We have set up in our petition that there can be ascertained and has been ascertained in the East Texas Oil Field accurate information as to sand thickness, properties of the reservoir sand and fluid contents, so as to estimate the quantity of oil and gas that underly respective leases, but that the Commission, notwithstanding it has this information available to it, has not undertaken to set up any plan of proration that takes these factors into consideration, and that these factors must be taken into consideration in order to give us an equal opportunity to recover that oil to which we are fairly entitled to, but that as a matter of fact, in the present plan the disparity between the poorest wells in the field and the best wells in the field is four barrels per day.

The Court:

I think I understand, gentlemen, the nature of your attack asks for a permanent injunction.

Mr. Tocker:

Yes, sir, we asked for a temporary injunction, but we have foregone that.

629 The Court:

Now, I think you gentlemen, in asking for this pre-trial hearing, you must have had some idea in mind as to something you could gain by having this. In other words, you want the other parties to agree to some things?

Mr. Tocker:

Yes, sir.

The Court:

And have you told them what they are?

Mr. Tocker:

No, we haven't told them what they are, but we have done this, we have taken both pleadings and analyzed them, and we have what facts and what allegations stand denied, and we would like the other side at this time to agree those fact allegations are those in dispute, and the fact issues in the case, the only fact issues in the case, and if there are any that stand denied they can agree on this morning we can eliminate those. In addition to that there is certain documentary evidence will have to be introduced that we want to agree on.

The Court:

In a pre-trial hearing, of course, the only way you get down to the benefit of it is to get down to cases, you can't talk generalities, you have to get down to saying, "We want to agree that this instrument is true, and agree we

can introduce this without proving it, and this one and this one," and in that way get down to specific things themselves.

Mr. Tocker:

We have such a list.

The Court:

Now, this rule provides for the holding of one of these hearings for the purpose of simplification of issues. Do you expect to amend anymore?

Mr. Hart:

If the Court please, we wish to file an amendment to our answer, of which a copy of that amendment has been given to counsel for complainant, and I understand they have no objection to our filing that amendment.

630 We have also just been furnished this morning with a supplemental complaint which makes new allegations which we haven't had time to study yet, and we would like an opportunity to.

The Court:

That will bring the pleadings to a close, will it?

Mr. Hart:

Yes, sir, I think so.

The Court:

Now, the first matter of simplification of issues in these equity cases, of course they are simplified a good deal by the way in which they are required to plead. They have to admit or deny or plead they are not in a position to do either. Haven't they done that?

Mr. Tocker:

Yes, they have.

The Court:

Now, in what respect have they denied your pleadings that you think they ought not to?

Mr. Tocker:

Well, there has been a denial of the position of the wells on our lease. What we would like for the respondents to do at this time is to agree that the following fact issues are the only issues in dispute as a result of the pleadings.

The Court:

Have you got them reduced to writing there?

Mr. Tocker:

Yes, sir.

The Court:

Suppose you let them look at them. (Paper passed to Mr. Haft.)

Mr. Tocker:

Since that was prepared, your Honor, they have filed an amended answer in which they have followed the new rules of Court and stated there were certain allegations they have no information on, as to the truth of it. Therefore they just stated they neither denied or admitted. Now, in addition to what is in that paper there will be issues they have now expressly denied, as a result of the pleading this morning.

Mr. Tilley:

That is rather lengthy, your Honor.

The Court:

Ordinarily they admit names of parties and residences, and admit you have a lease on certain property, and admit you have the wells you allege on the property, so we



can get to the questions involving opinion, say their improper method of proration, and then they won't admit, and then you have all these other matters admitted in their pleadings. They admit, I suppose, the promulgation of their order you attack?

Mr. Pollard:

Yes, sir.

The Court:

The rock you split on is whether the order is valid or not. Those allegations in your pleading of the unreasonableness and invalidity of the order you can't expect them to admit, and I don't suppose they will admit.

Mr. Tocker:

No, sir.

The Court:

Now, on the question of documents, do you have some documents in the crowd with you?

Mr. Tocker:

We have a list of documents, that they are familiar with, that we are asking them to admit can be introduced.

The Court:

What kind of documents would be in the case other than the order?

Mr. Tocker:

We want to introduce a proration schedule.

Mr. Hart:

That is all right.

The Court:

They will agree to that.

Mr. Tocker:

Then we want to introduce a map or maps showing ownership and number of locations on tracts in  
632 the East Texas Field.

Mr. Hart:

We don't know what maps they intend to introduce.

The Court:

Ordinarily those things are done so expeditiously, are so simple in these cases I don't see why we are wasting time about it. Now, ordinarily they tack a map on the board and some witness identifies it as being a true map.

Mr. Tocker:

What we contemplate doing is have the respondents agree, after we have exhibited these instruments to them, they will agree they can be introduced without proof as to their authenticity, and in that way avoid bringing a lot of witnesses we would have to bring otherwise to prove up the map.

Mr. Hart:

If the Court please, if we are reasonably assured the map is accurate—

The Court:

What kind of maps, to show wells and spacing?

Mr. Tocker:

Yes, sir.

The Court:

Surface maps?

Mr. Tocker:

Yes, sir, surface maps.

The Court:

Well, I expect the Railroad Commission has just as good maps as you have.

Mr. Tocker:

Well, sir, we hope they do.

Mr. Pollard:

If we can have a copy of the map they have in mind we would not require them to introduce a surveyor. All we would want would be a chance to check its authenticity.

Mr. Tilley:

May we ask them on the Hudnall map, that is pretty well known to the Commission, it is an ownership  
633 map gotten up by Mr. Hudnall.

The Court:

I think so.

Mr. Tilley:

Will you agree to that?

Mr. Hart:

Yes, we will agree to that.

The Court:

I have never seen any trouble yet about those maps or graphs, they have always put them in.

Mr. Tilley:

It will just save us a lot of time.

The Court:

What do you want to show, where the wells are located?

Mr. Tilley:

The density of the wells and the size of the tracts, and Hudnall's map has been generally accepted by most of the oil people as an ownership map.

The Court:

Not to indicate formation or anything like that, just a surface map?

Mr. Tilley:

Yes, sir.

Mr. Hart:

We will not object to the use of that map, but reserving the right to show if it is incorrect in any way, if it is.

Mr. Pollard:

We would likewise like to show that the maps, from the very nature of the relative size of the dots which denote wells, are sometimes wholly disproportionate, as to the size of the tract, but those are matters I think we can fully agree on between ourselves.

Mr. Tecker:

We would want an agreement at this time from the respondents, without the necessity of subpoenaing, the records of the Railroad Commission showing information as to sand thickness and fluid properties be made available in the trial of this case, in East Texas.

634

Mr. Hart:

We agree to that.

The Court:

Let the record show you agree to that.

Mr. Hart:

But I would like to have notice of what they want.

The Court:

I think that is reasonable.

Mr. Tilley:

And that uncertified copies can be used.

Mr. Hart:

We will agree to that.

Mr. Tocker:

We also want the records of the Railroad Commission of potential tests in the East Texas Field.

The Court:

These records are all public instruments?

Mr. Pollard:

Yes, sir. However, the volume of that would be rather large, if they wanted us to bring them all there.

The Court:

I think it is fair if you stipulate that in as much as those are all public documents you will give them access to any of them.

Mr. Pollard:

Yes, sir.

The Court:

And particularly if they designate what it is they want.

Mr. Pollard:

Yes, sir, we would be glad to furnish it.

The Court:

I don't know whether you are required to furnish them copies of them.

Mr. Pollard:

We will be glad to give them the information that they specify.

Mr. Hart:

If the Court please, some of the records, as I understand, are located in East Texas, and we will have to have several days' notice to get them.

Mr. Tocker:

All right.

Mr. Tilley:

We have not agreed that we can introduce these copies without their being certified. We can do that  
635 without their being certified?

Mr. Hart:

Yes, sir.

The Court:

Whatever you agree to, whatever is stipulated, ought to be written up.

Mr. Pollard:

That was all right, it was stipulated, he didn't understand.



Mr. Tocker:

May I suggest, your Honor, that we hard—they have had an opportunity to examine our list, we hand it to the Court reporter, and they agree to supply it, the records will be made available to us as indicated on there, subject to notice, and that such records as we intend to introduce will be admissible subject to examination by respondents, and then we won't have to go through all this; is that all right, Jim?

Mr. Hart:

Yes.

The Court:

That is agreeable, I understand. Now you are referring to the records of the Commission?

Mr. Tocker:

And the map we just mentioned, and all the rest on here are records of the Commission, yes, sir.

The Court:

They are certainly not going to object to the admissibility of any record on any ground other than it is not material to the case or something of that kind. If it is their own record they won't question the authenticity of it. It is simply a question of the mechanics of your getting it. They say they will make it available to you if you give them notice of what you want, and you can expect it, and I presume they will allow you to make copies of it.

Mr. Tocker:

Does that apply to the instruments on the list here?

636 The Court:

If it is a matter of which they have copies in large numbers they will probably give you copies.

Mr. Hart:

We will agree they can have available for examination, for making copies, any of the records of the Railroad Commission, or any maps, and we will not object to substitute copies on the ground that they are not certified. We don't understand, though, that we are under obligation to produce those records in Court, but that you will have copies made of such as you want and have them there at Court yourself; we won't have to produce them.

The Court:

I think that is right.

Mr. Tocker:

It may put a pretty heavy burden on us to make copies of all the records we want to introduce. I was just wondering if they wouldn't agree, if they are too voluminous to be copied, agree that they will be introduced and with the permission of the Court copies thereafter made.

Mr. Hart:

All right, we will make any reasonable agreement of that kind.

The Court:

What is the nature of the records, just orders of the Commission?

Mr. Tocker:

For example we want, as I have stated, all records of the Railroad Commission showing information of sand thickness in properties of the East Texas Field; records of the Railroad Commission on potentials based on key

wells in the East Texas Field; records of the Railroad Commission particularly with reference to the complaint in this case and the one of R. M. Woods, we want the records of the proceedings on the application of 637 R. M. Woods for permit to drill wells as an exception to Rule 37; we want the proration orders of the Railroad Commission for all other fields in Texas made available.

The Court:

Well, I imagine all those records exist in mimeograph, don't they?

Mr. Tocker:

Yes, sir.

The Court:

So they will probably give you some of those complimentary.

Mr. Pollard:

Our point was that he refers to all of the records of sand formations, and that would mean core records or well log records of over 25,000 wells in the East Texas Field alone.

The Court:

I think he would have to be more specific than that.

Mr. Pollard:

We will be glad to furnish whichever data it is they want.

(The list referred to by counsel for complainant is here-  
to attached at page 27.)

(Reporter's Note: Such list not attached to pre-trial transcript.)

Mr. Hart:

If the Court please, we also don't wish to admit some of this evidence he has spoken of is relevant.

The Court:

Not admitting its admissibility, simply its authenticity.

Mr. Tocker:

I think we are clear on that, your Honor. Now, the rules provide for agreement, if possible, on the limitation of the number of expert witnesses. I think we are prepared to state this morning how many expert witnesses we will have, and who they will be.

638 The Court:

I have found in a good many of these cases that the lawyers are reasonable about that; experts are not so plentiful or cheap that they will bring a great many of them. If you go to limiting it they say they want this expert on this phase of it and this one on another phase, and it is pretty hard to limit it. My experience is they rarely run over three or four.

Mr. Tocker:

I am wondering if at this time they know how many experts they plan to use.

Mr. Hart:

We don't know exactly what their witnesses are going to testify. We can't tell how many we will need. I don't see how we can bind ourselves to any particular number.

The Court:

"The Court will limit it if you contemplate, for instance, if you are going to put on eight or ten experts who are going to testify the same thing I will stop it. But I think you will find that will solve itself. How many do you think you are going to have?"

Mr. Tocker:

We are going to have three.

The Court:

It isn't a question of who has the most witnesses, it is a question of who has the best.

Mr. Tocker:

That is the premises we are willing to stand on.

The Court:

I will not limit the number of experts now, I will reserve the right to limit them on the trial, if they go to giving the same evidence.

Mr. Tocker:

These suggestions come from us in accordance with the new rules.

639 The Court:

Then we will just leave the matter of experts out, and won't make any limitations.

Mr. Tocker:

All right, sir.

Mr. Hart:

If the Court please, in connection with these records, I wonder if counsel would admit that true copies of the

records that are in the Comptroller's office may be introduced in evidence.

Mr. Tocker:

Yes, sir.

The Court:

All right, let the record show that.

Mr. Tilley:

One other thing in reference to expert testimony, the Court has tried a lot of these cases, and I know how many—you know how much rebuttal testimony there is. We may be able to stipulate who we contemplate using so we would save a lot of time preparing cross examination, so we won't have to delay in order to get testimony we will have to have in connection with it.

The Court:

I don't think the rule contemplates that they are going to tell you who their witnesses are going to be.

Mr. Pollard:

I don't think so either.

Mr. Tocker:

It is generally indicated we might do that.

The Court:

If they want to tell you who their witnesses will be, that is all right. Do you want to do that?

Mr. Pollard:

We don't know. I don't think we could do that, we just don't know.



Mr. Tocker:

What do we understand is the Court's pleasure with reference to the issues made by the pleadings? Does the Court feel that under the old equity rules that the probable issues are made as best they can be made and no agreement is necessary on those at this time?

640 The Court:

I don't think you need anything on it. We have tried dozens of these cases without trouble before under the old practice. The point is you come in and prove your lease and your wells, and then you give your opinions as to whether this order is wrong or not, and the case will gradually get down to that point.

Mr. Tocker:

Perhaps between now and the time of trial, with the copy that we have furnished the Attorney General, we can get together.

The Court:

You are not denying anything, are you, except their allegation that the order is unreasonable and void?

Mr. Hart:

That is substantially all. Of course, we have denied in detail their detailed allegation with reference to that issue.

Gov. Moody:

May I ask if you will make one or two agreements? First, the Railroad Commission has found that sand conditions in the East Texas Field with respect to permeability and porosity is substantially the same throughout the field?

Mr. Hart:

We can't agree to that.

The Court:

They refuse to agree on that.

Gov. Moody:

Will you agree that the Railroad Commission has found that the more wells drilled on the basis of one well to ten acres, the greater the ultimate recovery of oil?

Mr. Hart:

No, sir, we can't agree to that.

The Court:

They refuse to agree to that.

Gov. Moody:

Will you agree that the Railroad Commission has for a long time past and intends for the future, intends  
641 in the future to continue the method of prorating the East Texas Oil Field and allowing the proration, or allocating the proration between wells in the East Texas Field on the basis of potential alone?

Mr. Hart:

I think the orders speak for themselves in that respect, as to the basis on which the proration has been made, and we don't know what they are going to do in the future. We can't make any admission about that, except that the order is still in effect, and they intend to enforce it as long as it is in effect.

Gov. Moody:

Well, your Honor, my understanding is that the Railroad Commission adopted that policy some, oh, years, several years ago, Mr. Cottingham perhaps could tell, and it is repeated—of course, this is not evidence—it is repeated from month to month to month.

The Court:

I think those are matters that ought to stand by proof.

Gov. Moody:

The point I am making, your Honor, we can prove it by introducing copies of the orders, which come at the rate of twelve a year over a period of years.

The Court:

You are asking these counsel here to agree as to what their intention is in the future. Now, the Commission is an independent party. They are simply representatives of the Attorney General's office. They can't bind them here by admissions as to what they might do in the future. In fact, the law would contemplate that on the introduction of proof or from hearings that they might change their policy. The best evidence of their intention is the existence of continued enforcement of the present  
642 orders.

Gov. Moody:

But if the Commission declares its purpose to continue that policy.

The Court:

They said they won't agree to it.

Gov. Moody:

Let's see if they will agree to this, that the order of August 28, 1938, and orders entered since that date prorating the production of oil in the East Texas Field and allocating that field allowable among the wells in the field is based alone on the potential factor?

Mr. Hart:

If the Court please, I think it will be a whole lot simpler to introduce the orders and let them speak for them-

selves. That statement as to what they are based on is somewhat ambiguous.

The Court:

I think an agreement like that wouldn't be satisfactory, even to the Court. I would rather air out the orders and facts than to include some question like that in some fancy agreement. Anyway; regardless of how the Court feels about it, the parties don't want to agree to it.

Mr. Tocker:

There is one other point that we think they will agree on the testimony. At the time we filed the suit the order we complained of was the one dated August 28, 1938. Since that time there have been two or three orders entered continuing the present plan of proration, and so it won't be necessary for us to amend our petition to also complain of those orders.

Mr. Pollard:

In your amendment you allege it has been superseded in about the same percentage, as I understand.

Mr. Tocker:

That is correct, they get 2.32 per cent. We agree then that the orders that have been entered since the 643 order dated August 28, 1938, adopt the same basis of proration?

Mr. Pollard:

In a general way, yes, except as to minor variations.

Mr. Tocker:

And this complainant attacks that continuing system of proration without the necessity of amending and attacking each separate order.

Mr. Hart:

Yes.

Mr. Tocker:

That is agreed.

The Court:

Well, what will the record show with regard to that? Is it agreed that these orders that have been made since the filing of the suit are substantially the same as the one attacked in the original bill and it is unnecessary for the plaintiff to continue to amend to meet the orders as they are made.

Mr. Pollard:

Yes, sir, after the present time.

The Court:

All right, let the record show that. Is there anything further, gentlemen? Is there anything further from the plaintiff's side of the table?

Mr. Tilley:

Just a moment, if the Court please.

(Counsel for complainant and respondents then conferred briefly.)

Mr. Hart:

I am not sure this has been made plain, your Honor. I would like to have an agreement that both sides may introduce true copies of records of the Railroad Commission without the necessity of getting certified copies.

Mr. Tocker:

Yes, sir,

The Court:

Is there anything further from the defendant's side  
that you would like to bring up at this pre-trial  
644 hearing?

Mr. Pollard:

I want to say this; under No. 9 of the instruments he  
specifies is record of withdrawals from the R. M. Woods  
tract. I assume he refers to the Comptroller's records of  
withdrawals?

Mr. Tocker:

Yes, sir.

Mr. Pollard:

That is the amount of oil, taxes shown to have been  
paid by the Comptroller's records, and we are not sup-  
posed to furnish that to you, but to admit that when you  
have that record it will be admissible.

Mr. Tocker:

Yes, sir.

Mr. Tilley:

Now, if the Court please, there are some Schlumberger  
tests and logs and things like that, statistical matters and  
actual records by the various operators throughout the  
East Texas Field, and in the process of trying this case  
it would be necessary for expert witnesses to testify about  
conditions which the Commission, by virtue of its familiar-  
ity with those various logs and so forth—I think the testi-  
mony is probably admissible anyway, because it is general-  
ly accepted information, but will it be all right to admit  
that those logs are correct.

The Court:

Are the logs filed with the Commission?



Mr. Tilley:

No, sir, they are not filed with the Commission.

The Court:

Isn't the log of every well filed with the Commission?

Mr. Tilley:

They file a log, but not the Schlumberger generally.

645 . The Court:

I don't know about the Schlumberger, but the logs, I think the logs of the wells are filed with the Commission, and that certainly constitutes part of the Commission's records.

Gov. Moody:

Your Honor, what he is talking about are the electric log records or Schlumberger records, as they are called, of wells where the log is taken by the Schlumberger, and they have this long sheet of paper with the reports on it.

The Court:

You want a witness to testify from that, using that as a predicate on which to testify.

Gov. Moody:

What we are getting at is whether or not they will admit those logs as furnished by the Schlumberger people are correct without bringing the man that took them to prove up the record.

The Court:

I should think that if they produce an authentic Schlumberger test, that you have no doubt as to its being authentic, that you would not object to the witness testifying and using that as a basis on which to testify. I presume that it would have some character of certificate, some

evidence that it was a genuine, bona fide Schlumberger test.

Mr. Pollard:

It would have to depend, I think, in each instance upon the individual Schlumberger record they have. We couldn't agree as a broad proposition that each Schlumberger they bring forward, unknown at this time to them or to us, was accurately taken in every respect, and correctly and accurately reflects all the data.

Mr. Tilley:

We can limit that in this way, we will limit the agreement to an understanding that in the event you  
646 desire to contest any such log or schedule or whatever it is, that in the event you question that, why then that will not be admissible and the burden of proof will be on us, to support it by proper proof.

The Court:

Yes. As I understand it, you are going to introduce those matters as original evidence as a basis for some expert to testify from.

Mr. Tilley:

That is right.

The Court:

You can always ventilate those matters out on your expert. If he is any account as an expert, why you can certainly test him out on that Schlumberger test.

Mr. Tocker:

Your Honor, we would like for the agreement with reference to the copies of records, Railroad Commission records, to include the right to, where agreeable to respondents—

The Court:

Well, let's get one thing settled at a time. We haven't gotten past the Schlumberger matter yet. As I understand it, all they want you to agree, practically, is if they bring one of these tests, if you will agree it was actually made on the hole that they say it was. Now, as to the accuracy with which it was made or the effect of it, you don't agree to that.

Mr. Pollard:

We will do that, if they say they made the Schlumberger test on an individual well, we will agree to that, but if they want to use that as a factual basis for the expert opinion of some of their witnesses as to accuracy—

The Court:

You don't agree to the accuracy of it.

Mr. Pollard:

We would require them to prove it.

647 Gov. Moody:

The Schlumberger test is made, the result of it is there is a wavy line of points of high and low, and that is recorded on a record from which a photostatic copy is made. That shows it is made for the Schlumberger people, an electric log made on a certain well. Whether that device works well or doesn't work well, of course, is a matter we could not know. What we are asking them to do is when we present these records, these photostatic copies, which the gentlemen have seen, of the Schlumberger people, that they will agree it is a true copy of the Schlumberger log of that well, and as shown there that is what the Schlumberger test showed in that particular well, that is all we ask them to do, without requiring us to bring somebody up to prove that up.

The Court:

I think they wouldn't do that. You are willing to agree if they produce one of the Schlumberger tests and say it was made on such and such a well, you won't require them to bring the man that made the test, you will admit it, without admitting its accuracy or the way in which it was made?

Mr. Pollard:

Yes, sir.

The Court:

Is that right?

Mr. Hart:

If the Court please, if they don't have the man there that made it how can we find out whether it is accurate or not?

The Court:

Does anybody make those tests other than the Schlumberger people?

Mr. Tilley:

One other company, the Halliburton Oil Well Cementing Company. Let's agree if we produce what appears to be an official copy of a Schlumberger test, made by whoever it was made by, that it will be admissible, unless they want to question the accuracy of it, and in that event we will withdraw that particular one or introduce testimony to prove the accuracy of it.

Mr. Pollard:

That will shift to us the duty of disproving the accuracy of it, and we don't know whether it is accurate or not. We will admit when they produce that Schlumberger re-

cord, we will admit that it was taken, as to whether it was accurately taken or not we won't have any means to know.

The Court:

I think that is as far as I can ask them to go. The question of accuracy is one for the Court to decide, any light that may be thrown on that.

Mr. Tilley:

If it is just going to be admitted without any weight, why then I hardly understand how anything can be admitted that way.

The Court:

It is in evidence for whatever it is worth. Let the record show that the parties agree when they produce a properly authenticated Schlumberger test that it may be admitted in evidence as a test of the well that it purports to be a test of, the defendants not agreeing in any way to its accuracy or the facts shown by the test. Is there anything further?

Mr. Tocker:

Your Honor, we would like the agreement with reference to the copies of the Railroad Commission records, to extend that to the right to make a tabulation from such records, where practical, and correctly made. For example, you have the proration, montly proration orders from April, 1933, to the present date, based on hourly potential alone. Instead of introducing every one of those records we can just tabulate?

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The Court:

All right.

Mr. Tilley:

Right now, in reference to the tests that have been made to test sand and determine the water table, can we stipulate where that is made by a reliable company, such as the Humble Company, and we will let you say what a reliable company is, will that be admitted without bringing the particular person up or the particular official of the company up to establish the authenticity of that particular test?

Mr. Pollard:

No.

The Court:

You won't agree to that?

Mr. Hart:

Not in that form.

The Court:

Is there anything further, gentlemen, on either side? (No response.) All right, the Court will bring the hearing to a close.

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# EXHIBIT 1.

	Started	Completed
Todd 1-A.....	6-27-31	7-22-31
2-A.....	3- 7-32	3-19-32
3-A.....	6-25-33	7- 7-33
4-A.....	8-18-33	8-29-33
5-A.....	4-21-34	5- 3-34
6-A.....	5- 6-34	5-18-34
7-A.....	8- 8-34	8-25-34
Todd 1-B.....	11-14-31	11-27-31
2-B.....	10-18-31	11- 7-31



	Started	Completed
3-B.....	7-12-33	7-25-33
4-B.....	9- 3-33	9-18-33
5-B.....	5-21-34	6- 2-34

	Todd "A"	Todd "B"	Total
1931 .....	23,561.25	9,129.26	
1932 .....	34,360.67	40,112.83	
1933 .....	63,980.39	62,961.66	
1934 .....	85,228.11	71,140.36	
1935 .....	76,588.79	54,876.99	
1936 .....	62,188.33	44,078.65	
1937 .....	56,037.26	40,062.25	
1938 .....	45,994.00	32,891.91	

Total Cumulative Production to 11-1-39.....	447,938.80	355,253.91	803,192.71
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Number of Acres .....	28	25	53
Average per Acre Yield..	15,997.81	14,210.15	15,154.58

Total Woodbine thickness	90'— to 95'
Total net sand thickness	60'— to 65'—

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## EXHIBIT 2.

Barrels Now in Place.....	1,151,168
Daily Allowable Now .....	111.83
No. of Days to Recover All of the Oil With Present Daily Allowable .....	10.278
No. of Years (365 days each) .....	28.1
No. of Years (261 producing days) ..	39.3
Total Recoverable Oil in Field Now.	2,217,980,352
Daily Field Allowable Now .....	522,591

No. of Days to Recover All of the  
Oil With Present Daily Field

Allowable ..... 4,244=

No. of Years (365 producing days)..... 11.35

No. of Years (261 producing days)..... 16.26

Ultimate Recovery of the Field..... 3,522,710,352 100%

Production of Field to Date..... 1,304,730,000 37.04%

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2,217,980,352 Balance

Ultimate Recovery of Our Lease... 1,596,422 100%

Production to Date of Our Lease... 355,254 23.58%

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1,151,168 Balance

Average Woodbine Section field.... 42

Net Woodbine Sand Section..... 28.5

Woodbine Sand Section ..... 95. ft.

Net Sand Section ..... 65. ft.

80

885

4356 X .24% X .84% X .79% X .75% = 927.4 Bbls. per acre

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5.61

Percentage of Todd B reserves to total field .004276

Loss to 1-1-39 ..... 202,648 Bbls.

## EXHIBIT 3.

## Gladewater Townsite.

Company	Lease	Acreage	Wells
Allen, Hugo	Wood, R. M.	.30	1
Atlantic & Pacific	Harvey, E.	1.30	1-Abnd.
Bradley, W. W.	Fee	2.00	1
Bradley & Foshee	Godfrey, J. A.	4.75	2
Brown Eagle Oil Co.	T&P RR	14.50	5
Bumpas, Roy	Bumpas, R. E.	4.53	2-Abnd.
Burk Royalty Co.	Moore	1.5	1
Chief Prod. Co.	Todd, S. D. et al—Sec. 22.	2.00	1-Abnd.
Compton et al	Todd, S. D. et al—Sec. 24.	.75	1
Day & Company	Grimes, A. P.	.29	0
Day, L. & Armstrong	Jeter, L. A.	1.50	2
Dunham, C. G.	Walker, E. L.	1.26	2
	Foshee	2.00	2
	Jeter, J. T. "A"—Blk. 59	.75	1
	Jeter, J. T.—Blk. 58	1.50	2

Company	Lease	Acreage	Wells
Everett, L. J.	Fee	1.67	1
Everett & Phillips	Simmons Heirs	.72	1
Fields, Bert	Johnson, Ida	9.25	5
Fikes, L.	Turner, J. E.	.75	1
Florence, M. E.	Foshee, A. M.	2.50	2
	Rogers, F. E.	1.30	1
Gaskill, M. E.	Kay, Sam J.	1.86	1
	Kay, Sam J.	3.14	2
Gaskill, S. A.	Godfrey, J. A.	1.00	1
General American Oil Co.	Adams	.23	1
	Arnold	1.14	1-Abnd.
	Godfrey, J. A.	1.20	1
	Green	.25	1
	Stardivent, T. J.	2.00	3
	Turner	.15	1
	Wood, R. M.	2.00	1
Genro Drlg. Co.	Boyd, G.	1.30	1
			1-Abnd.
	Morgan, J. I.	.68	1
	Perry Estate	2.50	3

Gladewater Oil Co. ....	Johnson, Dellah	2.50	1
Gresham & Hunter	T&P RR "D" .....	2.00	1
	T&P RR "E" .....	2.00	1
	T&P RR "F" .....	2.00	1
	T&P RR "G" .....	10.00	6
Groneman .....	Thrasher, S. R. ....	.25	1
Hanbury, H. et al .....	Bray, T. L. ....	19.90	8
	Foshee, A. M. ....	2.50	2
	Gauge, J. H. "B" .....	.90	1
	Gauge, J. H. "G" .....	3.30	3
	Victory, J. H. ....	1.30	2
Hickman & Baird .....	T&P RR .....	2.00	1
Humble Oil & Refg. Co. ....	Fee .....	1.50	0
Iron Rock Oil Co. ....	Foshee, A. M.—Blk. 36 .....	1.30	2
	Foshee, A. M.—Blks. 44 & 45 .....	1.75	3
	Whittle, J. N. ....	.28	1
J. R. L. Oil Co. ....	M. E. Church .....	.66	1—Abnd.
	Stancil .....	.25	1—Abnd.
Johnson, T. A. ....	Victory, J. H. ....	2.50	2
Lange Cable Tool Drig. ....	Beamer, J. C. ....	.90	1
Laroe, Dan .....	DeMoss, J. E. ....	4.00	2
Lee, G. A. ....	Bell, Jim .....	2.00	2

Company	Lease	Acres	Wells
Lee, T. W.	Hospital Lot	.50	1
Lee & Burnett	Lee & Jackson	.85	1
	Walker, E. L.	.25	1
	Wood	1.00	2
Lee & Hankamer	Lee, T. W.	.60	2
Lucey, J. F., Rec.	Johnson, O. R.	1.00	1
Manziel, Bobby	Compton	.28	1
	New Hope Baptist Church	.70	1
	Tenery, J. B.	2.00	2
	Victory, J. H.	.80	1-Abnd.
	Walker, E. L.—Blk. 54	.80	1
			1-Abnd.
Manziel, Joe et al	Walker, E. L.—Blk. 62	1.10	1
	Moore, C. H.	1.50	1
Marla Fay Oil Co.	Perry Estate	1.00	0
Martinwood	Everett, L. J.	1.50	1
Mecco Prod. Co.	Walker, N. E.	.84	1
	Hickman, O. L.—Blk. 71	2.00	1
	Hickman, O. L.—Blk. 75	1.30	0
	Hickman & Bair	1.50	2
	Moore, C. H.	15.00	5



T&P—Blk. 48	1.70	1
Blk. 51	1.06	1
Blk. 56	2.00	1
Blk. 67	2.00	1
Blk. 68	2.00	1
Blk. 70	2.00	1
Blk. 73	1.30	1
Blk. 74	1.30	2
Blk. 76	1.30	1
T&P RR "A"	2.50	1
T&P RR "B"	1.50	1
Fee	.12	1
T&P RR	.13	1
Minnesota & E. Texas	2.00	1
Gladewater Ind. Sch.—Blk. 20	.52	2-Abnd.
Blk. 21	.50	1
Ritchet, Geo.	1.43	2-Abnd.
Kay, Sam J.	1.25	1-Abnd.
Lee, T. W.	4.00	3-Abnd.
Woods, E. M.	5.00	4
Wood, R. M.	3.26	1-Abnd.
Pet. P. L. & S. Co.	.27	1
Phillips, B. F.		
Baptist Church		

Company	Lease	Acres	Wells
Brazzil		.29	1
City of Gladewater		2.60	2
			1-Abnd
Phillips, L.	Fee	2.80	2
	York, W. H.	.06	1
	Fee	.50	1
	Phillips, A. H. "B"	1.00	1
	Phillips, L.	.86	1
Phillips et al	Everett, L. J.	1.00	0
	York, W. H.	.75	1
Powell, L. W.	Jackson, J. C.	2.00	2
	Perry Estate	.20	1
	Stancil	.63	1
	Tennery, J. B.	2.00	2
	Victory, J. H.—Sec. 29	.90	1
	Victory—Sec. 45	.10	1
Powell & Irion	Johnson, D.	1.09	1
	Smith & Moody	1.50	2
Prater Oil Co.	Sampers	.12	1
Producers Pet. Co.	T&P RR—Blk. 12	1.00	3
	Blk. 10	.14	1

R. & G. Oil Co.	Wood, R. W.	.41	2
Rancho Oil Co.	Johnson, Ida	4.50	3
Repp Oil Co.	Wood, R. M.	1.25	1
Reynolds & Kimberlin	Perry Estate	.17	1
	Thompson	.57	1
Roosth & Genecov	Wood, R. M.	20.17	8
			2-Abnd.
Rousch, Benny	Rodden, M.	.13	1
Rudco O. & G. Co.	Hobbs, H.	2.00	1
	Rodden—Blk. 13	.43	1
	Rodden—Blk. 126	.50	1
Shelby Oil Co.	Norton, E. T.	2.00	1
Simmons, E. J.	Jackson, J. C.	.70	3
Stewart	Jackson, J. B.	1.50	1-Abnd.
Swain & Hamilton	Wood, R. W.	1.00	1
Swain-Holcomb	Bray	.68	1
	Glade Baptist Church	.68	1
	Wood, R. M.	.05	2
Torbert, J. S.	Green, J. A.	1.12	1
Traders Oil Co.	Richet, Geo.	.60	1
Trentman Oil Corp	Gladewater School	1.50	1

Company	Lease	Acreage	Wells
United East & West	Armstrong	.16	1
	Dunnaway	1.25	1
	Hailley	.28	1-Abnd.
	Rodden, L. A.	.66	1-Abnd.
	York, W. H.	2.00	1
	Fee	2.00	1-Abnd.
Walker, E. L.	Godfrey, J. A.	3.10	3
Wilcox Oil Co.	Rodden, Miles	4.13	3
Wilson, E. L.	Walker, E. L.	40.00	16
	Wood, R. M.	.36	1
		321.43	249—
			27 Abnd.

## Kilgore Townsite.

Company	Lease	Acreage	Wells
Adams, O. D.	Presby. Church	.75	5
Anding, A. F. et al	Hirsch	.08	1
	Martin, G.	.41	2

Apple, Jack	Johnson, J. M.	3.00	2
Atlantic Refg. Co.	Elder, Trip "A"	7.36	2
	Elder, Trip "B"	1.00	1
	Barton, P. E.		
	Barton, P. E. "A"	2.00	2
	Kilgore High School	8.35	4
Barnes, S. B. & H. M.	Willoughby	.47	2
Barnes & Ryan	Bean, I. S.	.54	2
Barnett Pet. Corp.	Dickson & Saxon	1.36	4
Brown, W. A.	Cheeseborough, W.	1.53	2
	Williams	.86	1
Callender, L. W.	Rowland, R. H.	11.89	9
Carroll, B. F. et al	City of Kilgore	.25	2
	Evans, F.	.30	2
	Hendrick, T. A.	.15	2
	Laird	.15	2
	Sharp	.15	2
	Whittington	.15	1
Carroll-Thompson	Jerry-Rider—Block No. 118	.19	3
	Jerry-Rider—Block No. 120	.06	1
	Foltz	.65	4
Carter, Tom	Compton	1.50	6
Cooper, O. R.	Shaw, Tom	1.00	1

Company	Lease	Acreage	Wells
Davenport	Hale, J. M.	3.21	1
Dearing & Son	Wallace, M. (Fee)	1.00	3
Dearing et al	Dickson, J. M.	3.03	3
Degener & Co., Inc.	Bell, S.	1.67	2
Delta Drilling Co.	Dunn	1.50	1
	Alexander, L.	3.75	3
Dodwell	Alexander, L.	3.50	4
Echo	Elder, John	2.20	2
Everett, C. A.	Barton, Mrs. B. M.	5.22	2
Everts Drilling Co.	Barton	1.00	4
	Laird, J. H.	10.35	9
Fleming, J. H.	Church Lot	30	3
Galvez Oil Co.	Alexander, H. C.	15.00	5
Gold Star Oil Co.	Butts, J. T.	.70	2
Grace Oil Company	Barton, M. G.	1.50	5
	Hughey, M. B.	1.50	5
	Hughey, S. P.	1.50	3
Gray, E. J.	Adams-Hale	.06	1
	Horton-Dickson	.90	1
Gray, E. J. & Johnson	Hale, M. E.	.06	1
Hall & Hall	Dickson	.75	5



Hammill & Smith .....	Archbault .....	.07	1
	Barton, P. E. ....	.76	2
	Butts, J. T. Fee .....	.17	2
	Butts, J. T. Heirs .....	.22	2
	Culp, Mary .....	.50	5
	Dumas .....	.07	1
Hammill & Smith Cont'd .....	Griffin, E. B. ....	.10	1 <sup>o</sup>
	Hughey, J. B. ....	1.00	4
	Kilgore National Bank .....	.10	1
	Knowles, J. A. ....	1.61	9
	Knowles, J. A. "A" .....	.26	1
Harcher Oil Company .....	Crim, W. N. "A" .....	.37	1
	Crim, W. N. "B" .....	.13	1
	Laird, R. H. ....	.35	2
	Lodge, K. O. P. ....	.25	1
Hastings Oil Co. ....	Robinson, Wm. ....	3.60	3
Hastings & Dodson .....	Boatwright .....	.68	3
	Hughey, B. ....	.30	3
Henry Oil Company .....	Laird, S. S. & Ben .....	5.56	12
Hindman, S. E. ....	Dickson, J. M. ....	.08	1
Humble Oil & Refg. Co. ....	Cumby, Annie .....	1.00	0
	I. & G. N. RR. ....	7.40	0

Company	Lease	Acreage	Wells
	Kilgore Cemetery	3.93	0
	Knowles, J. A.	93.80	28
	Thomas, Dura	59.05	21
Humphrey, T. D.	Spear, A.	24.35	24
James, T. L.	James	.30	1
	Lacy, Lawson	21.50	19
Jenkins, J. J.	Alexander, C.	2.11	2
	Crane, Mrs. Nettie	1.41	4
	Dickson, J. M.	1.94	2
	King-Crim	.75	4
Jess-Bob Oil Co.	Anderson, Mattie	4.07	3
Kemp, J. E.	King	.77	4
Kennedy, R. E.	Hale	.06	1
King, J. S.	Fee	1.00	1
	King-Cope	.17	1
	King Heirs	.80	1
L&M Oil Co.	Acuff Heirs	1.43	2
Lacy, Lawson	Osborne-Williams	.41	1
Lacy, Roger	Beal	1.40	1
	Douglass, J. M.	2.10	4
	Fee	8.25	6

Fee "B" .....	11.45	8
Johnson, J. M. ....	1.00	1
Lacy, L. ....	2.95	4
Pendegast-Beal .....	11.92	8
Muckelroy .....	.80	3
Rice, E. ....	1.00	2
Griffen, W. C. ....	1.72	3
Ostrom .....	1.42	1
Fee .....	.16	1
Colored Baptist Church .....	1.06	2
Baptist Church .....	.15	2
Baptist Church .....	.10	2
Bradley .....	.07	1
Dickson .....	.51	4
Dickson "A" .....	.07	1
Laird, Roy .....	.65	4
Griffin, L. A. ....	44.50	19
Rowland, R. H. ....	12.49	6
Anderson, W. H. ....	.98	1
Crim, L. N. ....	.60	2
Crim, W. R. "A" .....		
Crim, W. R. "B" .....	1.60	4

Company	Lease	Acreage	Wells
Moore et al	Laird, Ben	1.30	4
	Laird Bros.	2.05	5
	Foltz, J. E.	.33	2
	Laird, Ben "B"	.50	2
Moss, Harry	Marshall, F.	30.00	16
			1-Abnd.
Murray, C. H.	Walton, Ida	4.67	3
	Odd Fellows Lodge	.29	1
	Walton, Ida	1.09	1
Nioco Oil Co.	Knowles, J. A.	7.03	9
Nix, R. H.	Barton, B. M. Est.	.17	1
Overton Refg. Co.	Butts, J. T.	.30	2
	Crane, J. M.	.39	2
	Crim, W. N.	.25	2
	Elder	.30	1
	Florence	.25	2
	I. & G. N. RR.	19.58	26
	Jerry	.05	1
Prothro	King Bros.	.77	2
		2.00	2
	Young	.18	1

Pace Pet. Co.	Elder, T.	1.40	4
Pearce, J. W.	Bantuella	1.00	1
	Borders, J. V.	.40	2
	Shaw, Golden	1.00	1
	Shaw, T. "B"	1.00	2
Pearce, W. B.	Elder, H. T. & Son	.59	1
Pearson, V. J.	King	.14	1
Pearson & Kemp	Young	.22	<del>1</del>
Phillips Pet. Co.	I. & G. N. RR.	7.50	6
Pierce, W. B.	James, J. W.	.25	2
Pettit, C., Trust	King, J. S., Jr.	1.78	3
	Utzman, Gladys	1.84	3
Potter Bros. Prod. Co.	Alexander	3.00	3
	Bagwell	.15	1
	Bagwell-Laird	.20	2
	Barton Est., B. M.	3.53	4
	Colored Baptist	2.12	3
	Compton	.04	1
	Crane, J. M.	.39	2
	Crane, M.	.43	1
	Crim, L. D.	.39	3
	Dickson, J. N.	.10	1

Company	Lease	Acreage	Wells
Potter Bros. Cont'd	Dillard, H.	.15	1
	Dillingham	.15	1
	Dixie Mercantile Co.	.21	2
	Florence, J. T.	2.10	2
	Florence, J. T. "A"	3.00	3
	Gelber	.75	2
	Griffin, L. P.	1.99	4
Potter, Tom	Park, P. S. Est.	.87	1
	Sparks, Julia N.	2.01	2
	Bantuella	.13	1
	Daniels	.80	2
	James	.15	1
	Martin	.07	1
Producers Inv. Corp.	Butts, J. A.	6.58	9
	Crim, W. N.	3.80	4
	Rowland, R. H.	4.30	6
Rancho Oil Co.	Bean-Crim	1.60	7
	Rufus, M.	.50	1
Reynolds, Roy A.	Elder, J.	1.50	2
	Elder, Mrs. Z.	2.95	4
Rochelle	Waters, G.	.25	1



Roosth & Genecov .....	Barker .....	15	2
	Laird, J. ....	.15	2
	Obeithier .....	.15	1
	Young .....	.14	2
Ryan, A. Y. ....	Spear .....	.76	2
Schulman, H. ....	City of Kilgore, Blk. 175 .....	1.75	2
	City of Kilgore, Blk. 176 .....	1.75	1
	Dorris, J. ....	3.56	3
Sharp, J. R. ....	Duncan, E. ....	1.26	3
	King, A. ....	.88	4
	Martin-Dickson .....	1.72	3
	Russell, Frank .....	.45	1
Shell Pet. Corp. ....	I. G. N. (Frmly. Tom Potter) .....	3.50	2
	I. G. N. (Frmly. Southport) .....	2.00	3
Simmons, Jay .....	Beal, W. R. ....	.50	1
	Pyle, O. E. ....	.50	1
Smith, H. R., Inc. ....	Alexander, L. ....	3.50	3
	Peterson, D. M. ....	6.18	5
	Sanders .....	.66	1
Southport Pet. Co. ....	Crowder .....	.20	1
Spear, A. B. ....	Ector .....	1.00	2
Stidham & Thrasher .....	Russell, B. D. ....	1.56	3

Company	Lease	Acreage	Wells
Sugar-Maritsky-Merritt	Griffin, L. P.	2.14	4
Thompson	Rider	.03	1
Tide Water Assoc.	King, J. S.	80.00	20
Trapp, M. E.	King, J.	2.00	5
Trippet, R. G.	Johnson, J. M.	7.50	4
Turnbow, W. G.	Heard, W. C.	.20	1
	Knowles, J. A.	2.00	1
	Lacy, R.	.45	3
Wardlow, L. J.	King	.11	1
Weaver-Crim	Crim-Reynolds	1.60	4
Wells & Gann	Johnson, Georgia	4.71	5
Whaley, E., Oil Co.	Elder, H. T. & Son	.50	4
Wrather, J. O.	Hughey	.50	6
Wrightsmith Oil Co.	Griffin, W. C.	.70	2
	Harris	1.31	2
		721.33	697—
			1 Abnd.

## London Townsite.

Company	Lease	Acreage	Wells
Ambassador Oil Co. ....	Hamilton Heirs .....	.48	5
Butler-Calhoun & Boynton .....	London School .....	2.59	15
Cable Tool Drilg. Co. ....	Fee .....	.14	1
Champlin & Bass .....	Rhodes & Deskin .....	.05	2
Fisher, F. W., Rec. ....	Alford, J. R. ....	6.95	6
	Consolidated .....	1.07	7
	Wilson, G. W. "A" .....	3.50	10
	Wilson, J. B. "B" .....	.75	4
	Wooley, D. ....	.12	1
G. B. R. Oil Co. ....	Harmon, Mrs. L. ....	2.61	6
	Thrash, E. S. ....	3.05	10
	Town Heirs .....	.49	1
General American .....	Thompson, M. L. ....	6.36	16
Haddaway, R. ....	Methodist Church .....	1.25	6
	Presbyterian Church .....	.30	1
Hollingsworth Drilg. ....	Odd Fellow Lodge .....	.10	1
Jackson, J. ....	Maxwell Bolt Lot .....	.08	1
Johnson & Burnham .....	Whellis, J. W. ....	.20	0
Kline, M. A. ....	Maxwell .....	.59	1

Company	Lease	Acres	Wells
McCullough Oil Co.	Thompson, M. L.	1.00	2
Major Oil Co.	Craven, M. M.	.40	2
	Presbyterian Church	.20	1
Oklahoma-Texas Trust	Neal, R. T.	2.00	5
Overton-Refg. Co.	London School	.53	3
	Maxwell Bolt Lot	1.29	3
	Pool, L.	.26	2
	Rhodes & Deskin	.02	2
Regent Oil Co.	Harmon, L. "A"	2.00	3
	Harmon, L. "E"	3.60	10
Reynolds, Roy A.	Thrash, E. S.	1.00	3
Sanders & Murchison	Eaton, Geo. W.	.20	3
Stanolind O. & G. Co.	Thompson, M. L.	.69	1
Tex-Jersey Oil Co.	Eaton, G. W.	1.18	5
	Keeling, W. P. "A"	5.48	7
	Keeling, W. P. "B"	.30	5
Thompson, Will	Thompson	.08	1
Walters & Sanford	Baptist Church	.50	2
		51.41	154

## Overton Townsite.

Carta Blanca .....	De Guerin .....	1.00	1-Abnd.
	Key-Moore .....	1.00	1-Abnd.
	Minor .....	2.50	1-Abnd.
	Moore .....	1.00	1-Prod.
	Priddy .....	2.50	1-Abnd.
	Teague .....	2.50	1-Abnd.
	Lawn .....	1.00	1-Abnd.
Cox .....	Flory .....	.60	1-Prod.
D. E. F. Oil Co. ....	Barton .....	1.00	1-Prod.
P. & S. Oil Co. ....	Barton .....	3.00	1-Abnd.
Trentman .....			
<hr/>		16.10	10—
			7 Abnd.

## Gladewater Townsite

Company	Lease	Acreage	Wells
Allen, Hugh .....	Wood, R. M. ....	.30	1
Atlantic & Pacific .....	Harvey, E. ....	1.30	1-Abnd.
Bradley, W. W. ....	Fee .....	2.00	1.
Bradley & Foshee .....	Godfrey, J. A. ....	4.75	2

Company	Lease	Acreeage	Wells
Brown Eagle Oil Co.	T&P RR.	14.50	5
Bumpass Roy	Bumpass, R. E.	4.53	2-Abnd.
Burk Royalty Co.	Moore	1.5	1
Chief Prod. Co.	Todd, S. D. et al—Sec. 22	2.00	1
Compton et al	Todd, S. D. et al—Sec. 24	.75	1
Day & Company	Grimes, A. P.	.29	0
Day, L. & Armstrong	Jeter, L. A.	1.50	2
Dunham, C. G.	Walker, E. L.	1.26	2
	Foshee	2.00	2
	Jeter, J. T. "A"—Blk. 59	.75	1
Everett, L. J.	Jeter, J. T.—Blk. 58	1.50	2
Everett & Phillips	Fée	1.67	1
Fields, Bert	Simmons Heirs	.72	1
Fikes, L.	Johnson, Ida	9.25	5
Florence, M. E.	Turner, J. E.	.75	1
	Foshee, A. M.	2.50	2
Gaskill, M. E.	Rogers, F. E.	1.30	1
	Kay, Sam J.	1.86	1
	Kay, Sam J.	3.11	2



Gaskill, S. A. ....	Godfrey, J. A. ....	1.00	1
General American Oil Co. ....	Adams .....	.23	1
			1-Abnd.
	Arnold .....	1.14	1
	Godfrey, J. A. ....	1.20	1
	Green .....	.25	1
	Stardivent, T. J. ....	2.00	3
	Turner .....	.15	1
	Wood, R. M. ....	2.00	1
Genro Drlg. Co. ....	Boyd, G. ....	1.30	1
			1-Abnd.
	Morgan, J. I. ....	.68	1
	Perry Estate .....	2.50	3
Gladewater Oil Co. ....	Johnson, Dellah .....	2.50	1
Gresham & Hunter .....	T&P RR "D" .....	2.00	1
	T&P RR "E" .....	2.00	1
	T&P RR "F" .....	2.00	1
	T&P RR "G" .....	10.00	6
Gropeman .....	Thrasher, S. R. ....	.25	1
Hanbury, H. et al .....	Bray, T. L. ....	19.90	8
	Foshee, A. M. ....	2.50	2
	Gauge, J. H. "B" .....	.90	1

Company	Lease	Acreage	Wells
	Gauge, J. H. "G"	3.30	3
	Victory, J. H.	1.30	2
	T&P RR	2.00	1
Hickman & Baird	Fee	1.50	0
Humble-Oil & Refg. Co.	Foshee, A. M.—Blk. 36	1.30	2
Iron Rock Oil Co.	Foshee, A. M.—Blks. 44 & 45	1.75	3
	Whittle, J. N.	.28	1
J. R. L. Oil Co.	M. E. Church	.66	1-Abnd.
	Stancil	.25	1-Abnd.
Johnson, T. A.	Victory, J. H.	2.50	2
Lange Cable Tool Drlg.	Beamer, J. C.	.90	1
Laroe, Dan	DeMoss, J. E.	4.00	2
Lee, C. A.	Bell, Jim	2.00	2
Lee, T. W.	Hospital Lot	.50	1
	Lee & Jackson	.85	1
Lee & Burnett	Walker, E. L.	.25	1
	Wood	1.00	2
Lee & Hankamer	Lee, T. W.	.60	2
Lucey, J. F., Rec.	Johnson, O. R.	1.00	1
Manziel, Bobby	Compton	.28	1
	New Hope Baptist Church	.70	1

Tenery, J. B.	2.00	2	2
Victory, J. H.	.80	1-Abnd.	1-Abnd.
Walker, E. L.—Blk. 54	.80	1	1
Walker, E. L.—Blk. 62	1.10	1-Abnd.	1-Abnd.
Moore, C. H.	1.50	1	1
Perry Estate	1.00	0	0
Everett, L. J.	1.50	1	1
Walker, N. E.	.84	1	1
Hickman, O. L.—Blk. 71	2.00	1	1
Hickman, O. L.—Blk. 75	1.30	0	0
Hickman & Baird	1.50	2	2
Moore, C. H.	15.00	5	5
T & P—Blk. 48	1.70	1	1
Blk. 51	1.06	1	1
Blk. 66	2.00	1	1
Blk. 67	2.00	1	1
Blk. 68	2.00	1	1
Blk. 70	2.00	1	1
Blk. 73	1.30	1	1
Blk. 74	1.30	2	2
Blk. 76	1.30	1	1

Manziel, Joe et al

Marla Fay Oil Co.

Martinwood

Mecco Prod. Co.

Mecco Prod. Co. Con'd.

Company	Lease	Acreage	Wells
	T & P. RR. "A"	2.50	1
	T & P. RR. "B"	1.50	1
Midfield	Fee	.12	1
	T & P. RR.	.13	1
Minnesota & E. Texas	Gladewater Ind. Scho.—		
	Blk. 20	2.00	1
	Blk. 21	.52	2-Abnd.
Nathan Pipe & Supply Co.	Ritchet, Geo.	.50	1
	Kay, Sam J.	1.43	2-Abnd.
	Lee, T. W.	1.25	1-Abnd.
	Woods, E. M.	4.00	3-Abnd.
P. & W. Oil Co.	Wood, R. M.	5.00	4
Pet. P. L. & S. Co.	Kay, Sam J.	3.26	1-Abnd.
Phillips, B. F.	Baptist Church	.27	1
	Brazzil	.29	1
	City of Gladewater	2.60	2
	Fee	2.80	1-Abnd.
	York, W. H.	.06	2
	Fee	.50	1
Phillips, L.	Phillips, A. H. "B"	1.00	1

Phillips et al	Phillips, L.	.86	1
	Everett, L. J.	1.00	0
	York, W. H.	.75	.1
Powell, L. W.	Jackson, J. C.	2.00	2
	Perry Estate	.20	1
	Stancil	.63	1
	Tennery, J. B.	2.00	2
	Victory, J. H.—Sec. 29	.90	1
	Victory—Sec. 45	.10	1
Powell & Irion	Johnson, D.	1.09	1
	Smith & Moody	1.50	2
Prater Oil Co.	Sampere	.12	1
Producers Pet. Co.	T. & P. RR.—Blk. 12	1.00	3
	Blk. 10	.14	1
R. & G. Oil Co.	Wood, R. W.	.41	2
Rancho Oil Co.	Johnson, Ida	4.50	3
Repp Oil Co.	Wood, R. M.	1.25	1
Reynolds & Kimberlin	Perry Estate	.17	1
	Thompson	.57	1
Roosth & Genecov	Wood, R. M.	20.17	8
Rousch, Benny	Rodden, M.	.13	2-Abnd.
			1

Company	Lease	Acreage	Wells
Rudco O. & G. Co.	Hobbs, H.	2.00	1
	Rodden—Blk. 13	.43	1
	Rodden—Blk. 126	.50	1
Shelby Oil Co.	Norton, E. T.	2.00	1
Simmons, E. J.	Jackson, J. C.	.70	3
Stewart	Jackson, J. B.	1.50	1-Abnd.
Swain & Hamilton	Wood, R. W.	1.00	1
Swain-Holcomb	Bray	.68	1
	Glade Baptist Church	.68	1
	Wood, R. M.	.05	2
Torbert, J. S.	Green, J. A.	1.12	1
Traders Oil Co.	Richet, Geo.	.60	1
Trentman Oil Corp.	Gladewater School	1.50	1
United East & West	Armstrong	.16	1
	Dunnaway	1.25	1
			1-Abnd.
	Hailley	.28	1-Abnd.
	Rodden, L. A.	.66	1
	York, W. H.	2.00	1-Abnd.
Walker, E. L.	Fee	2.00	1-Abnd.
Wilcox Oil Co.	Godfrey, J. A.	3.10	3



Wilson, E. L. ....	Rodden, Miles	4.13	3
Walker, E. L. ....		40.00	16
Wood, R. M. ....		.36	1
		<hr/>	<hr/>
		321.43	249
			27 Abnd.

## Kilgore Townsite.

Company	Lease	Acreage	Wells
Adams, O. D. ....	Presby. Church	.75	5
Anding, A. F. et al	Hirsch	.08	1
Apple, Jack	Martin, G.	.41	2
Atlantic Refg. Co.	Johnson, J. M.	3.00	2
	Elder, Trip "A"	7.36	2
	Elder, Trip "B"	1.00	1
	Barton, P. E.		
	Barton, P. E. "A"	2.00	2
Barnes, S. B. & H. M.	Kilgore High School	8.35	4
Barnes & Ryan	Willoughby	.47	2
Barnett Pet. Corp.	Bean, I. S.	.54	2
	Dickson & Saxon	1.36	4

Company	Lease	Acreage	Wells
Brown, W. A. ....	Cheeseborough, W. ....	1.53	2
Callender, L. W. ....	Williams .....	.86	1
Carroll, B. F. et al .....	Rowland, R. H. ....	11.89	3
	City of Kilgore .....	.25	2
	Evans, F. ....	.30	2
	Hendrick, T. A. ....	.15	2
	Laird .....	.15	2
	Sharp .....	.15	2
	Whittington .....	.15	1
Carroll-Thompson .....	Jerry-Rider—Block No. 118 .....	.19	3
	Jerry-Rider—Block No. 120 .....	.06	1
Carter, Tom .....	Foltz .....	.65	4
Cooper, O. R. ....	Compton .....	1.50	6
	Shaw, Tom .....	1.00	1
Davenport, J. M. ....	Hale, J. M. ....	3.21	1
Dearing & Son .....	Wallace, M. (Fee) .....	1.00	3
Dearing et al .....	Dickson, J. M. ....	3.03	3
Degener & Co., Inc. ....	Beil, S. ....	1.67	2
Delta Drilling Co. ....	Dunn .....	1.50	1
	Alexander, L. ....	3.75	3
Dodwell .....	Alexander, L. ....	3.50	4

Echo .....	Elder, John .....	2.20	2
Everett, C. A. ....	Barton, Mrs. B. M. ....	5.22	2
Everts Drilling Co. ....	Barton .....	1.00	4
	Laird, J. H. ....	10.35	9
Fleming, J. H. ....	Church Lot .....	.30	3
Galvez Oil Co. ....	Alexander, H. C. ....	15.00	5
Gold Star Oil Co. ....	Butts, J. T. ....	.70	2
Grace Oil Company .....	Barton, M. G. ....	1.50	5
	Hughey, M. B. ....	1.50	5
	Hughey, S. P. ....	1.50	3
Gray, E. J. ....	Adams-Hale .....	.06	1
	Horton-Dickson .....	.90	1
Gray, E. J. & Johnson .....	Hale, M. E. ....	.06	1
Hall & Hall .....	Dickson .....	.75	5
Hammill & Smith .....	Archbault .....	.07	1
	Barton, P. E. ....	.76	2
	Butts, J. T. Fee .....	.17	2
	Butts, J. T. Heirs .....	.22	2
	Culp, Mary .....	.50	5
	Dumas .....	.07	1
	Griffin, E. B. ....	.10	1

Company	Lease	Acreage	Wells
Hammill & Smith Cont'd.			
	Hughey, J. B.	1.00	4
	Kilgore National Bank	.40	1
	Knowles, J. A.	1.61	9
	Knowles, J. A. "A"	.26	1
	Crim, W. N. "A"	.37	1
	Crim, W. N. "B"	.13	1
	Laird, R. H.	.35	2
	Lodge, K. O. P.	.25	1
Hastings Oil Co.	Robinson, Wm.	3.60	3
Hastings & Dodson	Boatwright	.68	3
	Hughey, B.	.30	3
Henry Oil Company	Laird, S. S. & Ben	5.56	12
Hindman, S. E.	Dickson, J. M.	.08	1
Humble Oil & Refg. Co.	Cumby, Annie	1.00	0
	I. & G. N. RR.	7.40	0
	Kilgore Cemetery	3.93	0
	Knowles, J. A.	93.80	28
	Thomas, Dura	59.05	21
Humphrey, T. D.	Spear, A.	24.35	24
James, T. L.	James	.30	1
	Lacy, Lawson	21.50	19

Jenkins, J. J.	Alexander, C.	2.11	2
	Crane, Mrs. Nettie	1.41	4
	Dickson, J. M.	1.94	2
	King-Crim	.75	4
Jess-Bob Oil Co.	Anderson, Mattie	4.07	3
Kemp, J. E.	King	.77	4
Kennedy, R. E.	Hale	.06	1
King, J. S.	Fee	1.00	1
	King-Cope	.17	1
	King Heirs	.80	1
L. & M. Oil Co.	Acuff Heirs	1.43	2
Lacy, Lawson	Osborne-Williams	.41	1
Lacy, Roger	Beal	1.40	1
	Douglass, J. M.	2.10	4
	Fee	8.25	6
	Fee "B"	11.45	8
	Johnson, J. M.	1.00	1
	Lacy, L.	2.95	4
	Pendegast-Beal	11.92	8
	Muckelroy	.80	3
Laird, S. S.	Rice, E.	1.00	2
Lone Star Oil Co.	Griffen, W. C.	1.72	3

Company	Lease	Acreage	Wells
Lyons	Ostrom	1.42	1
McGee, G. I.	Fee	.16	1
McMurray	Colored Baptist Church	1.06	2
McVey, et al	Baptist Church	.15	2
McVey, W. M.	Baptist Church	.10	2
McVey, M. W.	Bradley	.07	1
	Dickson	.51	4
	Dickson "A"	.07	1
	Laird, Roy	.65	4
Magnolia Pet. Co.	Griffin, L. A.	44.50	19
	Rowland, R. H.	12.49	6
Miller, P. L.	Anderson, W. H.	.98	1
	Crim, L. N.	.60	2
	Crim, W. R. "A"	1.60	4
	Crim, W. R. "B"		
	Laird, Ben		
	Laird Bros.	2.05	5
Moore et al	Foltz, J. E.	.33	2
	Laird, Ben "B"	.50	2
Moss, Harry	Marshall, F.	30.00	16
			1-Abnd.



Murray, C. H.	Walton, Ida	4.67	3
	Odd Fellows Lodge	.29	1
	Walton, Ida	1.09	1
Nioco Oil Co.	Knowles, J. A.	7.03	9
Nix, R. H.	Barton, B. M. Est.	.17	1
Overton Refg. Co.	Butts, J. T.	.30	2
	Crane, J. M.	.39	2
	Crim, W. N.	.25	2
	Elder	.30	1
	Florence	.25	2
	I. & G. N. RR.	19.58	26
	Jerry	.05	1
	King Bros.	.77	2
	Prothro	2.00	2
	Young	.18	1
Pace Pet Co.	Elder, T.	1.40	4
Pearce, J. W.	Bantuella	1.00	1
	Borders, J. V.	.40	2
	Shaw, Golden	1.00	1
	Shaw, T. "B"	1.00	2
Pearce, W. B.	Elder, H. T. & Son	.59	1
Pearson, V. J.	King	.14	1

Company	Lease	Acreage	Wells
Pearson & Kemp	Young	.22	1
Phillips Pet. Co.	I & G. N. RR.	7.50	6
Pierce, W. B.	James, J. W.	.25	2
Pettit, C., Trust	King, J. S., Jr.	1.78	3
Potter Bros. Prod. Co.	Utzman, Gladys	1.84	3
	Alexander	3.00	3
	Bagwell	.15	1
	Bagwell-Laird	.20	2
	Barton Est., B. M.	3.53	4
	Colored Baptist	2.12	3
	Compton	.04	1
	Crane, J. M.	.39	2
	Crane, M.	.43	1
	Crim, L. D.	.39	3
	Dickson, J. N.	.10	1
	Dillard, H.	.15	1
	Dillingham	.15	1
	Dixie Mercantile Co.	.21	2
	Florence, J. T.	2.10	2
	Florence, J. T. "A"	3.00	3
	Gelber	.75	2

Potter Bros. Prod. Co. Cont'd.	Griffin, L. R.	1.99	4
	Park, P. S. Est.	.87	1
Potter, Tom	Sparks, Julia N.	2.01	2
	Bantuella	.13	1
	Daniels	.80	2
	James	.15	1
	Martin	.07	1
Producers Inv. Corp.	Butts, J. A.	6.58	9
	Crim, W. N.	3.80	4
	Rowland, R. H.	4.30	6
Rancho Oil Co.	Bean-Crim	1.60	7
	Rufus, M.	.50	1
Reynolds, Roy A.	Elder, J.	1.50	2
	Elder, Mrs. Z.	2.95	4
Rochelle	Waters, G.	.25	1
Roosth & Genecov	Barker	.15	2
	Laird, J.	.15	2
	Obeithier	.15	1
	Young	.14	2
Ryan, A. Y.	Spear	.76	2
Schulman, H.	City of Kilgore, Blk. 175	1.75	2
	City of Kilgore, Blk. 176	1.75	1

Company	Lease	Acreage	Wells
Sharp, J. R.	Dorris, J.	3.56	3
	Duncan, E.	1.26	3
	King, A.	.88	4
	Martin-Dickson	1.72	3
	Russell, Frank	.45	1
Shell Pet. Corp.	I. G. N. (Frmly. Tom Potter)	3.50	2
	I. G. N. (Frmly. Southport)	2.00	3
Simmons, Jay	Beal, W. R.	.50	1
	Pyle, O. E.	.50	1
Smith, H. R., Inc.	Alexander, J.	3.50	3
	Peterson, D. M.	6.18	5
	Sanders	.66	1
Southport Pet. Co.	Crowder	.20	1
Spear, A. B.	Ector	1.00	2
Stidham & Thrasher	Russell, B. D.	1.56	3
Sugar-Maritzky-Merritt	Griffin, L. P.	2.14	4
Thompson	Rider	.03	1
Tide Water Assoc.	King, J. S.	80.00	20
Trapp, M. E.	King, J.	2.00	5
Trippet, R. G.	Johnson, J. M.	7.50	4
Turnbow, W. C.	Heard, W. C.	.20	1

Wardlow, L. J.	Knowles, J. A.	2.00	1
Weaver-Crim	Lacy, R.	.45	3
Wells & Gann	King	.11	1
Whaley, E., Oil Co.	Crim-Reynolds	1.60	4
Wrather, J. O.	Johnson, Georgia	4.71	5
Wrightsmith Oil Co.	Elder, H. T. & Son	.50	4
	Hughey	.50	6
	Griffin, W. C.	.70	2
	Harris	1.31	2
		<hr/> 721.33	<hr/> 697—
			1 Abnd.

## London Townsite.

Company	Lease	Acreage	Wells
Ambassador Oil Co.	Hamilton Heirs	.48	5
Butler-Calhoun & Boynton	London School	2.59	15
Cable Tool Drlg. Co.	Fee	.14	1
Champlin & Bass	Rhodes & Deskin	.05	2
Fisher, F. W., Rec.	Alford, J. B.	6.95	6
	Consolidated	1.07	7
	Wilson, G. W. "A"	3.50	10
	Wilson, J. B. "B"	.75	4
	Wooley, D.	.12	1

Company	Lease	Acreage	Wells
G. B. R. Oil Co.	Harmon, Mrs. L.	2.61	6
	Thrash, E. S.	3.05	10
General American	Towns Heirs	.49	1
Haddaway, R.	Thompson, M. L.	6.36	16
	Methodist Church	1.25	6
Hollingsworth Drlg.	Presbyterian Church	.30	1
Jackson, J.	Odd Fellow Lodge	.10	1
Johnson & Burnham	Maxwell Bolt Lot	.08	1
Kline, M. A.	Wheelis, J. W.	.20	0
McCullough Oil Co.	Maxwell	.59	1
Major Oil Co.	Thompson, M. L.	1.00	2
	Craven, M. M.	.40	2
Oklahoma-Texas Trust	Presbyterian Church	.20	1
Overton Refg. Co.	Neal, R. T.	2.00	5
	London School	.53	3
	Maxwell Bolt Lot	1.29	3
	Pool, L.	.26	2
Regent Oil Co.	Rhodes & Deskin	.02	2
	Harmon, L. "A"	2.00	3
	Harmon, L. "B"	3.60	10
Reynolds, Roy A.	Thrash, E. S.	1.00	3
Sanders & Murchison	Eaton, Geo. W.	.20	3



Stanolind O. & G. Co.	Thompson, M. L.	.69	1
Tex-Jersey Oil Co.	Eaton, G. W.	1.18	5
	Keeling, W. P. "A"	5.48	7
	Keeling, W. P. "B"	.30	5
Thompson, Will	Thompson	.08	1
Walters & Sanford	Baptist Church	.50	2
		<hr/>	
		51.41	154

## Overton Townsite.

Company		Lease		Acreage Wells	
Carta Blanca	De Guerin			1.00	1-Abnd.
	Key-Moore			1.00	1-Abnd.
	Minor			2.50	1-Abnd.
	Moore			1.00	1-Prod.
	Priddy			2.50	1-Abnd.
	Teague			2.50	1-Abnd.
Cox	Lawn			1.00	1-Abnd.
D. E. F. Oil Co.	Flory			.60	1-Prod.
P. & S. Oil Co.	Barton			1.00	1-Prod.
Trentmar	Barton			3.00	1-Abnd.
				<hr/>	
				16.10	10—
					7 Abnd.

## EXHIBIT No. 4.

Railroad Commission of Texas.

Oil and Gas Division.

Case No. .... Rule 37.

In Re: Application of Rowan & Nichols for Special Permit to Drill Wells Nos. 6 to 25 Inclusive on the B. C. Todd, et al, 25 Acre Tract, Wm. Castleberry Survey, Gregg County, Texas.

Hearing Held in Austin, Texas,  
State Capitol,  
March 11, 1938, 1:30 P. M.,

Before

R. C. Granberry, Chief Deputy Supervisor.

Record Prepared by Louise Kirk, Oil & Gas Division,  
Railroad Commission, Austin, Texas.

## Appearances:

Rice M. Tilley, Fort Worth, Texas,

A. H. Rowan, Fort Worth, Texas,

Representing: Rowan &amp; Nichols, Applicants.

L. F. Burke, Longview, Texas,

W. R. Robinson, Gladewater, Texas,

Jack Hearrell, Gladewater, Texas.

Representing: R. M. Wood, Protestants.

J. B. Robertson, Austin, Texas,

Representing: Magnolia Petroleum Co., Shell  
Petroleum Corp., Protestants.

J. A. Rauhut, Austin, Texas,

F. E. Heath, Dallas, Texas,

Representing: Sun Oil Co., Protestants.

R. O. Garrett, Shreveport, La.,

Representing: Arkansas Fuel Oil Co., Protestants.

J. W. Stayton, Austin, Texas,

Representing: The Atlantic Refining Co., Protestants.

685 Mr. Burke:

Let the record show that my client is only appearing for the purpose as will hereafter in this hearing be shown. We don't appear for the purpose of protesting the granting of these permits on a density theory but only as will hereafter be shown in the proper time.

Mr. Tilley:

Mr. Granberry, in order to make our position clear I want to state that the application to the contrary notwithstanding this application is primarily an application for an adjustment of the allowables in reference to the Rowan & Nichols tract, their Todd "B" lease, and the alleged Wood tract and so far as that is concerned, all the wells in the field.

Mr. Granberry:

If the primary purpose is for the adjustment of the allowable I think you are in the wrong Court. I think you would want a hearing before the Engineering Department of the Commission which looks after that part of the Commission's work. We have taken jurisdiction here because it was an application to drill.

Mr. Tilley:

I didn't apply to any division except the Oil & Gas Division of the Railroad Commission. We assume that the Commission will have to have before it all the facts and I don't know very well how the Oil & Gas Division of the Railroad Commission itself can divided itself up into different divisions. We asked for a hearing before the Railroad Commission and assumed that the Railroad Commission delegated you to hold this hearing. We assumed that, a record being made, the supervisor would pass on the applications for permits insofar as recommendation to the Railroad Commission was concerned and that maybe someone else would pass on the adjustment of the allowable or make a recommendation to the Commission separately, because we assume that the Commission will pass on the matter in its entirety.

Mr. Granberry:

We can hear your evidence.

Mr. Tilley:

I don't want to be understood that it is applying before any particular division of the Railroad Commission but that we are making this application before the Railroad Commission and I assume that the Commission will have all this evidence before it. But I want it understood that we are asking primarily for an adjustment in the allowable because we submit that we have sufficient wells already to adequately develop our lease and enough to give us an equal opportunity to recover our share of the recoverable oil in the pool. Therefore we ask for the permits only in the event the Commission refuses to give us what we think we are entitled to in the way of an adjustment of allowable and the Court holds that we are not entitled to an adjustment in allowable. I would like for the record to show this, Mr. Granberry,

that in this request we will submit a new application, if that be necessary or advisable, and attach one plat to the other application and ask for all the wells in one application so that your file will not be so voluminous.

Mr. Granberry:

That will be acceptable to the Commission.

Mr. Burke:

As far as R. M. Wood is concerned, as Mr. Tilley has stated it is primarily for the purpose of an adjustment in allowable, we say that this hearing is of no  
687 force and effect because it isn't before the proper tribunal. We were notified to come down here on the proposition of 17 or 18 additional wells, and if primarily the purpose is to adjust the allowable in the field, I think that is a collateral attack on Rule 37 and this tribunal—the Court would be the proper tribunal for that hearing.

Mr. Tilley:

Swear Mr. Rowan and Mr. Burke please.

(A. H. Rowan and L. F. Burke duly sworn as witnesses.)

L. F. BURKE, witness:

Questions by Rice M. Tilley:

Q. Mr. Burke, you represent R. M. Wood?

A. Yes, that is correct.

Q. You have already made your appearance here?

A. For the limited purpose as stated in the record.

Q. She has your initials? What are your initials?

A. L. F.

Q. You practice law in Longview?

A. That is correct.

Q. You got a notice within 10 days that the hearing on these applications for permits—that this application would be heard today, didn't you?

A. I didn't get notice, Mr. Wood got some character of notice. I don't know whether it was in ten days or not but he got some character of notice.

Q. Did he also get a letter from us to the effect that the application included a prayer for adjustment of allowables before this hearing?

A. I don't know about a letter.

688 Q. You don't know?

A. No.

Q. When was the first time you heard about the application for adjustment of the allowable?

A. I would say a few months ago.

Q. Your client didn't tell you about it?

A. Not anything about a letter. He had some kind of a sheet showing all the wells and the spacing of them.

Q. He didn't say anything about getting a letter from me?

A. I don't recall anything about a letter.

Q. You didn't know anything about the adjustment of the allowable until you got here this morning?

A. Not except what has been said here.

Q. That's all. Swear Mr. Hearrell please.

(JACK HEARRELL, sworn as a witness.)

Mr. Tilley:

Mr. Hearrell, did you hear anything about an adjustment of allowables until this morning?

Mr. Hearrell:

No.



Mr. Tilley:

Swear me, please.

(MR. TILLEY duly sworn as a witness.)

My name is Rice Tilley and I represent the Rowan & Nichols Oil Company, the applicants here, and I on behalf of the applicant filed with the Railroad Commission the applications on which this application is being held and which Mr. Granberry has agreed could be heard all in one application, which includes a letter on the stationery of Tilley & Tocker, dated February 22, 1938, addressed to the Railroad Commission of Texas, which is marked as the applicants Exhibit No. 1. I want to say that this letter was dictated in my office and 689 within forty-eight hours of the time it was dated it was mailed to all the persons named in the notice of the Railroad Commission of February 24, 1938, which is marked applicant's Exhibit No. 2, at the same addresses. Now, Mr. Hearrell or Mr. Burke, did either of you ever see this notice before?

Mr. Burke:

I believe that is what we received. What I mean by that is this is what I have seen.

Mr. Tilley:

Where have you seen that?

Mr. Burke:

Mr. Wood gave this to me but as far as a letter is concerned, I haven't seen the letter. This is the only thing I have seen.

Mr. Tilley:

Did you know—did he say anything to you about the contents of a letter from us?

Mr. Burke:

No.

Mr. Tilley:

Did he tell you he got this through the mail?

Mr. Burke:

He showed this to me. He didn't say how he got it. He gave that to me. I saw a copy of this Exhibit No. 2, the applicant's Exhibit No. 2. I have seen this, but that is all I have seen in regard to this application.

Mr. Tilley:

Is Gladewater his address? Mr. Wood's address?

Mr. Burke:

He lives in Gladewater.

Mr. Granberry:

Mr. Garrett, did you receive a copy of a letter from Mr. Tilley to the effect—

Mr. Garrett:

I did. I received that letter the first part of the week. A matter of a few days before the date of the hearing.

690 Mr. Granberry:

The letter wasn't addressed to Mr. Burke or Mr. Hearrell.

Mr. Tilley:

But the point I want him to testify about is this. I am testifying now, not just stating. We mailed this to the same persons with the same addresses as those to whom you mailed these notices. Did the Sun Oil Company get a copy of our letter dated February 22?

Mr. Heath:  
They did.

Mr. Tilley:  
Did Shell and Magnolia?

Mr. Robertson:  
I think so.

Mr. Tilley:  
You say you got a copy for the Arkansas Fuel?

Mr. Garrett:  
Yes.

Mr. Rauhut:  
Mr. C. B. Jeffrey of our office got a copy of it.

Mr. Garrett:  
We got one addressed to Arkansas Fuel and one to me personally.

Mr. Stayton:  
Atlantic got a copy.

Mr. Robertson:  
Shell and Magnolia have furnished me with copies of that letter. They don't say when they received it or that they did receive it. I assume that they did or they couldn't be furnishing a copy.

Mr. Granberry:  
I don't believe that there is any question but that this notice went to the proper persons the same as the notice. They were both sent through the mail.

Mr. Rauhut:

The letter you refer to is dated March 1st?

Mr. Tilley:

February 22nd.

691 Mr. Granberry:

That was the Commission's notice. I believe your letter is dated March 1st.

Mr. Tilley:

I believe that is correct. I was mistaken.

Mr. Granberry:

The Railroad Commission's notice is dated February 24th.

MR. A. H. ROWAN, having first been duly sworn as a witness, under oath testified as follows upon examination:

By Mr. Tilley:

Q. Mr. Rowan, your name is A. H. Rowan?

A. That is correct.

Q. What position do you hold, if any, with Rowan & Nichols?

A. I am president of the company.

Q. Are you a drilling contractor?

A. Yes.

Q. How long have you been in the oil business?

A. About 15 or 16 years for myself.

Q. You are a producer?

A. Yes, sir.

Q. How long have you been drilling wells in Texas?

A. I have been actively engaged in the contracting business for myself since January 1, 1924.

Q. Have you drilled wells in East Texas?

A. Yes.

Q. Approximately how many?

A. More than fifty. I don't know how many.

Q. Have you studied papers and textbooks on petroleum production and drilling of oil and gas wells and generally in reference to underground conditions in the production of oil?

A. Yes.

692 Q. You say you are familiar with the East Texas field because you have drilled wells there?

A. Yes.

Q. Do you have a lease in the East Texas field?

A. Rowan & Nichols Oil Company have two leases there.

Q. What is the total of the B lease?

A. It is a 25 acre lease on the William Castleberry League and Labor in Gregg County, Texas.

Q. How many wells do you have on it?

A. Five wells on the lease at the present time.

Q. I would like at this time—I think you can testify as to the number of those wells and approximately when the application was made and when they were granted.

A. The Nos. B-1 and B-2 were filed on 9/30/31 and the authority to drill was granted on 10/20/31 by the Railroad Commission. B-3 and B-4 were filed—the applications for permission to drill were filed 6/17/33 and the applications were granted by the Railroad Commission on 7/5/33. The well No. B-5, the application to drill was filed 4/30/34 and the application was granted on 5/2/34.

Q. Have you applied for those wells which are authorized under the various rules and regulations of the Railroad Commission and the spacing Rule 37 since you first drilled your first well?

A. Yes, sir, all those applications are in exception to Rule 37. The first two wells were drilled under the 20

acre spacing rule which was in effect in 1931 by the Railroad Commission and the only exception 693 which was necessary in that case was the rule which provided that the wells must be 330 feet from the property line. The width of the lease wasn't sufficient to drill a well—to make it possible to drill a well 330 feet from the lines and it was necessary to get an exception for those wells.

Q. Have you drilled all the wells the Railroad Commission would let you drill on your tract?

A. Yes, sir.

Q. As a matter of fact have you had to go to Court to force them to let you drill some of those wells?

A. Yes, we filed suit. The application was granted before the suit came to trial.

Q. But some time after it was filed?

A. Yes.

Q. Mr. Rowan, state where your lease is with reference to what we commonly refer to as the fairway in the East Texas field?

A. The lease is located on what is called the Gladewater nose and it is approximately in the center of the Gladewater nose and it is in the middle of the field so far as the east and west direction of the field goes, approximately in the middle of the field, and is one of the highest points, if not the highest point, in the East Texas structure.

Q. Do you know approximately what the sand thickness is in that area?

A. We have a known sand thickness of 90 feet.

Q. You have knowledge of that much?

694 A. Yes. It was still in the sand.

Q. It is probably more?

A. It is probably 100 feet or better.

Q. At the time this field was discovered and that area was proven, what was the estimated per acre recovery on this Todd B lease?



A. We have always estimated it to have a recovery of 700 barrels per acre foot and that was a conservative estimate placed on that area in the early life of the field. However, it is possible that the estimate may be too low. The lease may have greater possibilities than that.

Q. Have you had any reputable geologist or engineer give you any estimate of the recoverable oil per acre from that area or have you heard any estimates given by any such reputable men?

A. I haven't had any written report made on it but I have discussed the matter with geologists and petroleum engineers at various times in the last five years and that estimate seemed to be an acceptable estimate to all I discussed it with.

Q. Just discuss very briefly the sand conditions in the East Texas field generally as to whether or not they are uniform with reference to permeability and porosity and such things.

A. Generally I think they are uniform as to porosity and permeability. On the east side of the field the sand goes into shale and thickens to the west.

Q. How far would you say drainage would take place there around your lease?

A. It is all a common structure or reservoir.

Q. It is a common reservoir?

695 A. Yes. The sands are interrelated and in that particular spot right there there is quite a little bit of gravel in the sand which gives a high permeability. We know from tests that at 1320 feet the drainage will take place very quickly, 1320 feet from wells. Just how far drainage would take place I am unable to testify definitely.

Q. That showed it was a common pool or common reservoir?

A. Yes.

Q. Mr. Rowan, state what advantage the fairway, what you call the fairway, has over the east or what is called the east and west sides of the field?

A. Well, the middle of the field or fairway is the thickest—has the thickest sand thickness. The east side, of course, tapers out to where the sand gets into shale and on the west side the water comes up underneath it and it goes from the producing sand of one foot on up until it gets into this middle part of the field which is the thickest part of the producing sand in the field.

Q. Under open flow conditions what advantage would it have?

A. The middle of the field, with the greatest sand thickness would produce the greatest amount of oil.

Q. It would produce the greatest amount of oil?

A. Yes.

Q. What would happen on the west and east sides?

A. The west would go to water and the east would go to pumping.

Q. How many barrels of oil per acre per day could probably be pumped on the east while you produced with the very high potentials on the fairway, if you can give any relative percentages? Or any general estimate as to that.

A. I don't know, Mr. Tilley. Certainly the middle of the field would flow longer than the east side.

Q. What would you say the potential is on this lease, on the Todd "B" lease?

A. I would say it is somewhere between 900 and 950 barrels per hour.

Q. Now, what is the potential of the wells, as many as 400 or 500 wells on the east side?

A. They range from less than 20 barrels up to 200 or 300 barrels.

Q. Generally how many wells are on the pump in East Texas? Do you know?

A. I don't know.

Q. Do you know, Dr. Heath?

Mr. Heath:

Something in excess of 4000, I believe.

Mr. Tilley:

Will you gentlemen agree that is correct?

Mr. Burke:

No.

Q. Mr. Rowan, are there large numbers of wells in the East Texas field with a potential of not over 100 barrels that are producing within 5 barrels as much oil per day per well as your wells?

A. There are a great many wells in the East Texas field that will not produce over 100 barrels and those wells are being allowed 20 barrels per day allowable.

Mr. Granberry:

What is your allowable?

A. It is about 22 barrels. A little less than 22, I believe. It is between 21 and 22.

Q. Have you estimated what per cent of the  
697 oil per day that you should be getting if the Railroad Commission would permit you to produce that amount of oil which is the ratio between the total recoverable oil in the field and the total recoverable oil under your lease? Just use general or rough figures.

A. No, sir, I haven't made any estimate on that. The only estimate I have made is that using strictly a potential basis of allocation which is the basis which the Railroad Commission is attempting to use now, if the field was put on a potential basis solely, my allowable would be greater, compared with the number of wells—compared with some of the wells which are not able to produce as much oil as mine.

Q. Would you say three or four times as great, as much?

A. Yes, I would say more than that.

Q. Mr. Rowan, are you familiar with the location of what is known as the R. M. Wood approximately .1 of an acre tract?

A. I know where the R. M. Wood well is, yes, sir.

Q. Where is that with reference to the Todd "B" lease?

A. It is to the south of the easterly southeast corner of the Todd lease.

Q. Say that Mr. Wood has 1 acre there, although I understand that you are now questioning his title to that, is that right?

A. I don't know—I don't question his title to the tract that well is on because I think the well is 6 feet south of our line.

Q. I mean you don't claim it is his land?

A. No, I don't. The land which he is claiming I don't think is his land.

Q. If he has 1 acre there—you have how  
698 many acres in your "B" lease?

A. 25.

Q. Then with one acre there he is producing per well approximately the same that you are producing from any one of your wells?

A. That is right.

Q. Are all your wells producing from the same formation and under the same sand conditions that his well is producing from?

A. I think so.

Q. And if he has one acre then you have just 25 times as much acreage as he has?

A. That is correct.

Q. And as much sand as he has?

A. I think the same thickness is the same on both leases.

Q. And if he has only .1 of an acre then you have 250 times the advantage, is that right?

A. That is correct.

Q. Are you complaining of the Railroad Commission permitting them to produce as much oil from that well on .1 of an acre as you are producing from 5 acres per well on your 25 acres?

A. I am. That well and other wells in the field.

Q. In other words, your hands have been tied so that you can't drill any more wells and they refuse to give you any increased allowable to take care of that discrimination.

A. They have unless they grant it now.

Q. They have heretofore refused you permits?

A. Yes, that is correct.

Q. And Mr. Rowan, I will ask you whether or not there are innumerable tracts in the East Texas field which have at least two or three wells on tracts of 5-699 acres or less?

A. Yes, sir, there are.

Q. You are complaining of that condition also?

A. Yes.

Q. Mr. Rowan, if the Railroad Commission would give you the allowable which you think would represent your proportionate—give to you eventually your proportionate part of the oil in that pool—would it be unnecessary for you to drill any other wells?

A. It would be.

Q. Can you produce as much as 300 barrels or 200 barrels a day from those five wells without creating any unnecessary waste?

A. How many barrels?

Q. 250 to 300 barrels.

A. Yes.

Q. Could the Railroad Commission of Texas enter an order adjusting the allowable of all wells in the field on a potential and/or acre of oil sand basis disregarding

the marginal well law and prevent discrimination between wells unfavorably situated as against those favorably situated without creating unnecessary waste?

A. Yes, sir, they could.

Q. In other words, that condition could be relieved without increasing the present daily allowable for the East Texas field?

A. It could.

Q. You can recover, can you, Mr. Rowan, all  
700 the recoverable oil under your lease with the exception of a very few barrels with the number of wells you already have?

A. I would say you will never recover all the oil from any sand in any field but we have enough wells on our lease that we think will economically drain the lease if it is properly produced.

Q. The drilling of additional wells, is the drilling of additional wells conducive to waste or prevention of waste?

A. It depends on how you allocate the allowable. If you allocate the allowable on a strick per well basis without other factors it is conducive of waste.

Q. In the East Texas field would you say the drilling of additional wells would be conducive to waste under the present conditions and orders?

A. It probably would be with the very dense drilling, maintaining the same allowable that is maintained now.

Q. What about fire hazard?

A. It is conducive to fire hazard.

Q. The drilling of additional wells?

A. Yes. That has been demonstrated by the fire in Kilgore recently.

Q. Unless the Railroad Commission does permit you to increase your allowable and/or decrease the allowable of the Wood well proportionately or drill additional wells, then your oil is going to be confiscated?

A. We feel that way, yes, sir.



Q. At lease your equal opportunity to produce that oil is going to be paralyzed or frozen or retarded?

A. Yes, I think that we are going to lose some oil. There will be some drainage taking place from our lease.

Q. Substantial?

A. Yes.

Q. Mr. Rowan, have you drilled your wells with reasonable diligence since your discovery of oil there—since oil was discovered in the immediate area where your lease is situated?

A. We think we have. We drilled the first two wells under the Railroad Commission's orders which granted one well to each 20 acres in the East Texas field and we waited over a year before we drilled any more because we thought that was the law and that the orders of the Railroad Commission were going to be enforced covering the drilling density of 1 well to 20 acres except on small tracts where an exception might be made to take care of that small tract. It became apparent to us that we were going to have to drill more wells or lose our oil and we made application and drilled additional wells. We think that we have protected ourselves as good as we could up to this time with the opposition that we have had in getting additional wells granted.

Q. Under the present orders?

A. Yes, under the present orders.

Q. You mean you have exerted every effort that you possibly could?

A. Yes.

Q. You stated you drilled every well the Railroad Commission under its rules would let you drill?

A. That is correct.

Q. And so drilled those wells if the Railroad Commission had or will hereafter give you an allowable to which you are entitled up to this time or which you would be entitled to hereafter you

could produce the amount of oil which you estimate is the recoverable oil under your lease, to-wit, originally about 70,000 barrels per acre?

A. I think we could.

Q. How do you—how much do you estimate is your per acre recovery now?

A. It is around 57,000 or 58,000 barrels per acre.

Q. Will you ever get that much oil under the present conditions?

A. Not unless we drill more wells or there is a change in the method of allocation. I think—I don't think we will.

Q. Will the drilling of further wells allow you to recover that if the Railroad Commission gives other operators the right to drill too?

A. I don't think so.

Q. The drilling of additional wells will not necessarily give you the amount of oil which you think you are entitled to recover under the theory we proposed awhile ago unless they give you a large number of wells?

A. If they granted these 20 permits, is that what you are talking about?

Q. If they granted 5 permits, would that give you the recoverable oil?

A. I don't think so, Mr. Tilley.

Q. Was there anything, any obstruction of any kind, on this alleged Wood tract to have kept him from drilling sooner if he wanted to?

A. Not that I know of, if he owned the land.

703 Q. There was no physical condition out there which would have kept anybody from drilling a well on that area?

A. No, sir.

Q. That is all. I would like to ask Mr. Robinson a question. You have heard the testimony of Jo J. White and you have made some investigation with reference to the Wood tract. Will you testify approximately what

that figured acreage of the alleged R. M. Wood tract is in the Castleberry survey?

Mr. J. B. Robertson:

I haven't calculated it and I don't know and couldn't answer your question except that Mr. White testified—his testimony was to the fact that he didn't have any acreage and the testimony of the other surveyor was—I don't know really just what acreage the other surveyor said.

Mr. Tilley:

You have studied that abstract and know whether or not there was more than an acre, don't you?

Mr. J. B. Robertson:

It is my recollection that Mr. Wood never claimed but one acre but I couldn't make any statement as to what acreage is there under any of the contentions. I am sorry.

Mr. Granberry:

Mr. Hearrell, do you know how much acreage the applicant claimed there?

Mr. Tilley:

Mr. Robinson was in that case. Mr. Robinson, how much did you state?

Mr. W. R. Robinson:

One acre.

Mr. Tilley:

You surveyed that?

Mr. Robinson:

Yes.

704 Mr. Tilley:

There was some question or controversy as to whether it was .1 of an acre or 1 acre?

Mr. Robinson:

By moving the lines around it could be computed at any acreage. The plat submitted showed one acre.

Mr. Tilley:

Mr. White claimed under your field notes there was .1 of an acre, didn't he?

Mr. Robinson:

I don't recall that.

Mr. Tilley:

You didn't hear his testimony?

Mr. Robinson:

No.

Mr. Tilley:

That is all.

Mr. J. B. Robertson:

I want to correct my statement that the applicant claimed only one acre. I understand that Mr. Wood claimed he owned other land in that vicinity to the north of the tract on which he made application and that his statement was that he hadn't included in the application all of the land which he contended he owned and I believe he further testified that he thought probably he had lost title to a good deal of it by limitation and as to some of the other excess he thought he could recover it but I don't—I wouldn't—he hadn't yet attempted to do so but was restricting his application to the area shown within the lines on the plat which he

submitted in connection with his application for Wood No. 1 and it was my understanding that it has never been contended that contained more than one acre.

Mr. Tilley:

You know from Mr. Robinson's testimony and other testimony that the tract to which he is claiming title is now under his permit and in the litigation which has been had one acre or less?

705 Mr. Robertson:

I couldn't really say that it is actually there. All I can say is what he claimed.

Mr. Rauhut:

That question of acreage was discussed in that hearing on the application of R. M. Wood and surveyors testified. As far as we are concerned and to shorten the record we would be willing to consider that testimony in the record if it is necessary here.

Mr. Granberry:

Let the file reflect that.

Mr. Tilley:

I don't want to offer that record in evidence. I do want to state this myself as my testimony that Jo J. White, licensed surveyor, made a survey of the Shell tract which is immediately south of the Wood tract and his testimony was according to the plat that Mr. Robinson prepared according to any construction of the field notes there couldn't be more than 1/10th of an acre there between the Shell lease and the Rowan & Nichols lease. That is all.

## Cross Examination of Mr. Rowan.

By Mr. Rauhuts.

Q. Mr. Rowan, do I understand that you have no quarrel with the top allowable for the field?

A. That is correct.

Q. You think that it is necessary to have a top allowable for the field to prevent waste in the field?

A. I think it is very necessary to have it.

Q. You have no quarrel with the present top allowable for the East Texas field?

A. No.

Q. Do I understand further you have no quarrel with Rule 37 as being necessary and that there should be some restriction in the number of wells drilled in the field to prevent waste?

A. I think that Rule 37 is a good rule and that you should have a rule governing the orderly development of a field and also for the prevention of fire.

Q. I understood some statement was made awhile ago that you had an advantage—if the Wood tract has .1 of an acre you would have an advantage of 250 to 1 over Wood; is that your statement?

A. In acreage.

Q. What about the allowable?

A. Not necessary in allowable. Actually I wouldn't have.

Q. In allowable your allowable is how much? What ratio as compared to his?

A. It is the same now.

Q. Per well?

A. Yes.

Q. Five times as great on your lease then?

A. Yes, I think it is.

Q. Approximately 5 times. Your lease is approximately 5 times his lease allowable?

A. Yes.



Q. You say that you probably will under the present set-up lose oil by drainage to other leases?

A. Yes, sir.

Q. Do you contend that you are suffering any drainage—that your lease is suffering any drainage to the Sun Oil Company wells?

A. No, sir, I don't. I think the Sun Oil Company is suffering the same drainage that I am suffering.

Q. Those leases adjoining your lease which have a similar density as your lease or no density advantage over your lease, do you contend they are draining any oil?

A. No, I don't.

Q. The leases which have a density advantage over your lease are the ones which are draining your oil? Under the present set-up?

A. That and the leases situated on the structure in a less favorable position than mine are causing some drainage. Those immediate leases around me are situated in about the same position on the structure. I don't think there is any drainage taking place there.

Q. Which of those leases adjoining you? The ones similarly drilled? Drilled to a similar density?

A. Similar density and about the same position on the structure.

Q. That is all the questions I have.

#### Re-Direct Examination.

By Mr. Tilley:

Q. Mr. Rowan, I want to ask one question. You say that you have no crow to pick with Rule 37. You mean you have no crow to pick with reasonable drilling regulations?

A. That is right. My understanding of his question was an abstract question as to whether we should have

Rule 37, just a spacing rule governing drilling and spacing of wells in any field. I think you should have a rule.

Q. You mean a uniform rule which means something and you don't mean with a limitation in it that there shall be some exceptions from that rule.

A. I feel about like Judge Hutchinson did  
708 when we tried that suit before him that the rule should be the rule and not the exception.

Q. The tail should not be wagging the dog?

A. That is correct.

Mr. Granberry:

You mean there should not be exceptions to the rule?

Mr. Tilley:

That is different. I don't mean that. It should be a uniform spacing rule. I understand there must be exceptions to it.

Mr. Granberry:

Isn't that what Rule 37 provides?

Mr. Tilley:

I don't know what Rule 37 provides but if it provides what the policy of the Commission has been under it then I say it isn't my conception of what a uniform spacing rule should be.

Mr. Granberry:

It provides that wells in the East Texas field shall be spaced 330 feet from the property lines and 660 feet apart and provides that exceptions to the rule will be granted to prevent confiscation of property.

Mr. Tilley:

To protect vested rights. I understand that. That is what I object to. I say that Rule 37 should have an exception to it but there should be another rule—

Mr. Granberry:

It provides—then you are complaining about the administration of it and not the rule itself.

Mr. Tilley:

Yes, I am complaining about the administration of it:

709 Mr. Rowan:

I would like to make a statement for the record that there have been more exceptions to Rule 37 in the East Texas field than there have been wells drilled under the rule itself.

Mr. Granberry:

How many of your wells are exceptions?

Mr. Rowan:

Every one of them.

Mr. Tilley:

You understand, Mr. Granberry, I don't think that anybody who has a tract of land who has acted in good faith and who has a sufficient amount of oil to justify its recovery of it should be prevented from recovering it. My objection to Rule 37 if it means what the policy of the Commission has been, which I assume is the Commission's interpretation that one well can be drilled on 5 or 10 acre tracts and permits refused for additional wells on that tract whereas another lot in the same field which has a common reservoir gets three wells and that lot is 50 by 100 feet, then I say that isn't uniform spacing according to my mind. I'm not criticizing you but I am criticizing the rule.

Mr. Granberry:

I think the rule is as uniform as it could be and provides exceptions. It must be the administration of the rule that you criticize.

Mr. Tilley:

Let me ask you this question, Mr. Granberry. Do you think that Rule 37 should be so construed and so enforced without any other rule taking care of property rights which will give R. M. Wood one well on 1 of an acre and Rowan & Nichols Oil Company on the same structure and in the same part of the field just the same allowable per well with 25 acres; is that your conception of what a spacing rule or producing rule should be?

710 Mr. Granberry:

We will hear the application now to drill additional wells on the tract. That would come up afterwards.

Mr. Tilley:

You understand what I am trying to bring out that we don't need any more wells to get that oil but what we need is more allowable.

Mr. Granberry:

You are asking for more wells whether you need them or not.

Mr. Tilley:

Only in the event you absolutely refuse upon this request to give us an adjustment in allowable which will give us what we are entitled to. Mr. Hearrell, what is the allowable of the Wood well?

Mr. Hearrell:

22 barrels.

Mr. Rauhut:

I want to ask Mr. Rowan a few questions:

Questions by Mr. Rauhut; answers by Mr. Rowan:

Q. Mr. Rowan, where there is one tract adjacent to another, having similar field conditions and sand conditions and one having an advantage over the other in allowable from the standpoint of the ratio of resources in place to such allowable there are two ways to adjust the allowable, aren't there? One is to reduce the allowable of the well or lease that has the advantage and the other is to increase the allowable of the lease which has the disadvantage.

A. That is correct.

Q. One means is just as effective as the other from the standpoint of adjustment, isn't it?

A. That is correct. I guess you mean from the standpoint of equity?

Q. Yes.

A. Yes.

Mr. Granberry:

How would you determine how much oil to allow a lease half a mile from the east edge of the field and one a mile from the east edge? How would you determine just what was the proper amount?

A. There are several factors which I think should be taken into consideration. One of them is potential and potential has a relation to permeability. Another one is the amount of acreage which that well is draining. Another one is the thickness of the sand which that well is draining. I think those are the most important factors which should be taken into consideration.

Mr. Granberry:

It would be pretty hard to make it exact and give every lease what it was entitled to, wouldn't it?

A. I think it would be impossible to make it exact but I think you could get it probably 300 or 400% more accurate than it is right now.

Questions by Mr. Tilley:

Q. You mean using the Railroad Commission's own map and own figures and own well core records and things like that?

A. Yes, they have all that information, all the information necessary.

Q. The Railroad Commission has the information necessary to do this if they wanted to resort to it and use it?

A. They do have, yes, sir.

Mr. Tilley:

I would like to ask Mr. Heath a question. How many wells are in East Texas?

Mr. Heath:

I haven't been sworn.

Mr. Tilley:

That's all right.

Mr. Heath:

About 25,000, a few less.

Mr. Tilley:

Do you know what the average density of the field is?

Mr. Heath:

It would be 25,000 divided into 134,000.

Mr. Granberry:

Approximately 5.4 acres per well, I think, or in that neighborhood. That would be pretty close for the average density.



Mr. Heath:

Five and a fraction. I think that the average figure I was using was a little higher than the figure you used, Mr. Granberry, as to the acreage. I used 134,000 acres. It would be 25 into 134.

Mr. Tilley:

I know you couldn't answer this question exactly but generally would you say the fairway was about as densely drilled on the average as the rest of the field?

Mr. Heath:

I expect there is a little greater density in the fairway.

Mr. Tilley:

A little greater?

Mr. Heath:

Yes.

Mr. Tilley:

How many acres would you estimate are in what is commonly referred to as the fairway?

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Mr. Heath:

About five acres per well. I would think so.

Mr. Tilley:

How many acres of the proven acreage would you estimate are in the fairway, just generally?

Mr. Heath:

That depends on what you call the fairway.

Mr. Tilley:

You mean between what limits?

Mr. Heath:

I am speaking of the fairway as being through the middle of the field but it might be construed to be very wide or very narrow.

Mr. Tilley:

What would you say would be the total number of acres approximately in the East Texas field with an average sand thickness, with a sand thickness of 60 feet or more?

Mr. Heath:

Formation thickness or sand thickness?

Mr. Tilley:

Saturated sand thickness.

Mr. Heath:

I couldn't even give an estimate on that.

Mr. Tilley:

The sand pinches out in what manner?

Mr. Heath:

The sand was laid down and later eroded and—by pinching out you mean, I presume, on the east side?

Mr. Tilley:

Yes.

Mr. Heath:

The section equivalent to the sand is no longer present in the east side because of erosion. It is gone.

Mr. Tilley:

You don't happen to have with you a map showing the picture of the sand there, do you, under the present

conditions where the water has encroached up to the present time?

714 Mr. Heath:

No, I don't, except that there must have been a considerable water encroachment.

Mr. Tilley:

Mr. Rowan, I believe you stated that you weren't getting the amount of oil you were entitled to with reference to your position on the structure with relation to the whole field?

Mr. Rowan:

I stated in my opinion that I wasn't.

Mr. Tilley:

Basing that on your information and all of what you are familiar with and what you testified and what you heard Mr. Heath testify?

Mr. Rowan:

Yes.

Mr. Tilley:

That is all.

Mr. Granberry:

We will hear any further questions from any objectors.

Mr. Rauhut:

The position of the Sun Oil Company is that it protests the granting of additional wells on this lease. We don't make any protest on the matter of adjustment of the allowable as far as that question is raised here. However, we state that of course since we have ap-

peared we want it understood that it is without prejudice to our own rights to have an adjustment of allowable if any adjustment is made. We desire to offer in evidence as the Sun Oil Company's Exhibit No. 1 the plat of the Rowan & Nichols Todd "B" lease and the wells thereon and the surrounding leases and wells and ask that it be identified as our Exhibit No. 1.

Mr. Granberry:

I will mark it Sun's Exhibit No. 1.

715 Mr. Tilley:

We have permission to introduce a larger map of this whole area. We will call that the applicant's Exhibit No. 3.

Mr. Rauhut:

In connection with the map marked Sun's Exhibit No. 1 we desire to offer in evidence a density statement of the adjoining leases, the result of which shows that the average density of the adjacent leases is 5.588 acres per well compared with Rowan & Nichols' present density of 1 well to each 5 acres.

Mr. Tilley:

What area does that cover?

Mr. Rauhut:

All adjacent leases.

Mr. Granberry:

Does that include the Wood lease?

Mr. Rauhut:

Yes, counting it as 1 acre as provided or specified in the application.

Mr. Granberry:

Whether it is 1 acre or less wouldn't affect this statement to any appreciable extent.

Mr. Rauhut:

We ask that that statement be marked the Sun's Exhibit No. 2.

Mr. Burke:

Our position would be that that is a conclusion on the part of the Sun Oil Company about the adjacent density.

Mr. Granberry:

That is based on actual figures as to acreage and the number of wells on the leases.

Mr. Rauhut:

The Commission's file shows the number of wells and the acreage of the leases. As Sun's Exhibit No. 3 we desire to offer in evidence a density comparison comparing the applicant's lease with the density of the surrounding area included within a circle drawn on the Sun's Exhibit No. 1, which circle has a diameter of such size as to enable it to include the surrounding area

8 times the size of the Rowan & Nichols Todd lease. This density statement shows the surrounding area within that circle is drilled to 4.762 acres per well, which is a fraction less than the Rowan & Nichols density. Dividing the 4.762 into the Rowan & Nichols' acreage of 25, it would appear that Rowan & Nichols would have to have 5.25 acres. About a quarter of a well extra would equal the surrounding density.

Mr. Granberry:

It would take .25 of a well to have an equal density.

Mr. Granberry (Ruhut):

Yes. We submit on that basis they are not entitled to another well on density.

Mr. Burke:

With reference to that statement and the introduction of that particular sheet of paper I want to take the position that we don't admit it is true. In other words, I object to it on the ground that it is a conclusion on their part.

Mr. Granberry:

As a conclusion?

Mr. Burke:

Yes.

Mr. Granberry:

Why is it a conclusion if it is based on facts?

Mr. Burke:

If it is based on facts, then my objection is no good. I don't want to sit here and take the position that we are admitting that these facts and figures are correct. That is our only position. We don't want to sit here and by our silence admit these things are true and correct. If they are true, we can't get around it. I don't know whether they are true or not.

717 Mr. Robertson:

The Shell Petroleum Corporation offers a density plat showing a comparison of 8 times the area showing that the 8 times area density is the same as the present density of the Rowan & Nichols Oil Company.



Mr. Granberry:

That is based on a square area and not a circular or rectangular area?

Mr. Robertson:

Yes.

Mr. Burke:

I make the same objection for the same reason. We object to this because we think these companies are plotting against us after we have won in the District Court.

Mr. Garrett:

I would like to say that the Arkansas Fuel Oil Company has had no correspondence with Rowan & Nichols Oil Company with relation to these permits and the permit for the Woods lease other than the letter previously introduced in the record which the attorney representing Rowan & Nichols sent to us as they did to all other operators in the area.

Mr. Rauhut:

I would like to make the same statement for the record on behalf of our clients. The only correspondence we have had with Rowan & Nichols was the letter supplementing the notice sent out by the Commission saying what else would come up at this hearing and we are here in response to the notice.

Mr. Garrett:

There has also been no oral or written communication between us.

Mr. Robertson:

As far as I know the Magnolia and Shell have had no communication of any sort further than as stated

by these other parties and they both protest—each of these companies protest the granting of any of these permits on the ground there is no justification thereof shown by the evidence and no facts shown which would justify the granting of an exception to Rule 37. With regard to the application for adjustment of allowable, neither of these companies has anything to say at this time.

Mr. Garrett:

The Arkansas Fuel Oil Company wishes to adopt the density statements and figures introduced in this record and protest the drilling of these wells on density grounds. However, we wish to call the Commission's attention to the fact that our Stevens lease located immediately to the northeast of the Wood tract and to the east of the Rowan & Nichols Todd tract is in relatively the same position as the Rowan & Nichols lease with regard to drainage conditions as testified to here. We feel that if any adjustment is made relative to these tracts, if the Commission deems that necessary, that we be made a party to such adjustment and that it is our opinion that the forcing of the Arkansas Fuel Oil Company to drill additional wells would be a confiscation of their property as it is our opinion that we have sufficient wells thereon to drain the recoverable oil from this tract if allowed to do so by the proper application of the police powers of this Commission.

Mr. Rauhut:

I would like to make a supplemental statement. I say the Sun Oil Company has no protest as far as the matter of adjustment of allowable is concerned. I would like to explain that. We might have a protest against some specific manner of adjusting the allowable. We don't know what sort of adjustment—if the Commission adopted any, we don't know what the Commission would adopt

719 and there has been no specific plan proposed and when it gets down to the specific problem, we might have some objection.

Mr. Granberry:

We understand that.

Mr. Rauput:

I mean the Sun Oil Company has heretofore requested the Railroad Commission to adjust allowables and we believe in the general proposition. We have no objection to the general proposition of adjusting the allowable. I don't want to be understood as agreeing that some specific adjustment that the Commission might make would operate fairly toward our leases. I don't want to be in that position. I don't know what the Commission or anybody else has in mind about specific adjustment or specific orders, if the Commission should see fit to adopt an order. I think it would be more appropriate for me to state as far as adjustment is concerned that we don't have anything to say on it.

Mr. Granberry:

I think your position is clear with reference to allowable.

Mr. Burke:

I want to introduce as our sole and only reason we have, except as heretofore stated, for the purpose of protesting the granting of the wells on certain portions of the said lease is that there is a bona fide title dispute as to a certain portion of the Rowan & Nichols oil and gas lease and I offer in evidence as our Exhibit No. 1 a certified copy of the petition filed in the District Court of Gregg County, Texas, and the certificate thereof as to a lawsuit which has been filed against the parties

named in the certified copy of the petition which is offered in evidence.

720 Mr. Granberry:

That will be Wood's Exhibit No. 1. Does that involve the title to this part of the Rowan & Nichols lease?

Mr. Burke:

Yes. It involves the title to the southern portion of the Rowan & Nichols lease. R. M. Wood filed it in trespass to try title.

Mr. Granberry:

Anything else for the record? Case submitted.

The State of Texas,

County of Travis.

I, Louise Kirk, an employee of the Oil & Gas Division of the Railroad Commission of Texas, do hereby certify that the above and foregoing is a true and correct transcript of my notes made at the hearing held in Austin, Texas, at 1:30 P. M., March 11th, 1938, to the best of my skill and ability.

Witness my hand on this the 12th day of March, 1938.

(Signed) LOUISE KIRK.

Sworn to and subscribed before me, a Notary Public in and for Travis County, Texas, on this the 12th day of March, A. D. 1938.

(Signed) ROSE MODRALL.

(Seal)

Notary Public in and for  
Travis County, Texas.

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## Railroad Commission of Texas.

## Oil and Gas Division.

Oil & Gas Dockets Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 and 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum Oil and Natural Gas and Relative to the  
Production, Storage, Transportation, Marketing or  
Processing of Crude Oil and or Natural Gas and  
Relative to the Purchase, Sale, Transportation and  
Handling of Crude Oil and Natural Gas and All  
Products, By-Products and Derivatives Thereof in  
the State of Texas.

Statewide Hearing Held in the City of Austin, Texas,  
March 19, 1938.

## Before

Hon. C. V. Terrell, Chairman,  
Hon. E. O. Thompson, Commissioner,  
Hon. Lon A. Smith, Commissioner.

## Appearances.

(Statewide Hearing 3-19-38.)

## Name — Representing — Address.

Baker, Rex. G., Humble O. & R. Co., Houston, Tex.  
Bartlett, W. O., Wynn Crosby Drilling Co., Houston,  
Tex.  
Bates, V. B., Glenn H. McCarthy, Inc., Houston, Tex.  
Boyd, Lynn, Panhandle Prod. & Royalty Owners Assn.,  
Pampa, Tex.

## Appearances—(Continued.)

Name — Representing — Address.

Brown, Kingston L., Grayburg Oil Co., San Antonio, Tex.

722 Buck, Raymond E., Barnsdall Oil Co., Ft. Worth, Tex.

Butler, Ira, Ft. Worth, Tex.

Byrd, L. H., Byrd-Frost, Inc., Dallas, Tex.

Caylor, Thos. L., United N. & S. Dev. Co., Luling, Tex.

Dietz, R. S., Panhandle Prod. & Royalty Owners Assn., Pampa, Tex.

Dunigan, E. J., Jr., Panhandle Prod. & Royalty Owners Assn., Pampa, Tex.

Edwards, Haynie E., McElroy Ranch Co., Ft. Worth, Tex.

Erwin, J. Ed., N. Tex. O. & G. Assn., Wichita Falls, Tex.

Figart, D. M., United N. & S. Dev. Co., Buckeye, Tex.

Flaitz, J. M., Union Producing Co., Houston, Tex.

Forester, C. G., Upton Co. Field Chamber of Commerce, McCamey, Tex.

Francis, Chas. I., Pure Oil Co., Et Al, Houston, Tex.

Garrett, R. O., Ark. Nat. Gas. Co., Shreveport, La.

Golay, Travis L., General American Oil Co., Dallas, Tex.

Goodman, James H., Mason Pool Operators, Midland, Tex.

Grant, L. S., McElroy Ranch Co., Crane, Tex.

Haves, E. P., The Texas Co., Houston, Tex.

Hock, W. C., Danciger Oil & Ref., Ft. Worth, Tex.

Holmesly, S. F., Humble O. & R. Co., Houston, Tex.

Howard, Del. Cities Serv. Oil Co., Bartlesville, Okla.

Joost, E. D., E. D. Joost Valley Oil Corp. & R. A. Welch, Houston, Tex.

Lusk, Chas. M., Self, Houston, Tex.

723 Marek, Ralph L., Stanolind O. & G. Co., Tulsa, Okla.

Mayfield, M. L., Cities Service Oil Co., Glade-water, Tex.



## Appearances—(Continued.)

## Name — Representing — Address.

Miller, J. S., Devonian Oil Co., San Antonio, Tex.

Myers, Ramond, Magnolia Pet. Co.

Neely, Harold G., West Central Texas Oil & Gas Assn.,  
Ft. Worth, Tex.

Noland, J. S., Barnsdall Oil Co., Tulsa, Okla.

Owens, Joe, Sun Pipe Line Co., Beaumont, Tex.

Parks, A. S., Conroe Operators, Houston, Tex.

Perlitz, Chas. A., Jr., Strake Pet. Co., Houston, Tex.

Powers, W. B., Magnolia Pet. Co., Rodessa, La.

Price, R. J., Transwestern Oil Co., San Antonio, Tex.

Reeves, Gartnet, Panhandle Prod. & Royalty Owners  
Assn., Pampa, Tex.

Rowan, A. H., Rowan & Nichols Oil Co., Ft. Worth, Tex.

Schroeder, John C., E. Tex. Ind. Pet. Assn., Longview,  
Tex.

Small, C. C., Cosden Oil Co., Amarillo, Tex.

Smith, Selwyn S., Upton Co. O. & G. Assn., McCamey,  
Tex.

Tilley, Rice, Rowan & Nichols Oil Co., Ft. Worth, Tex.

Warner, C. A., Houston Oil Co. of Tex., Houston, Tex.

Williams, D. E., Danciger O. & R., Inc., Pampa, Tex.

Williams, R. A., O. & G. Committee C. of C., McCamey,  
Tex.

Wilson, E. B., Stanley Gill, Houston, Texas.

724 Mr. Rice Tilley:

Mr. Chairman, did you call the East Texas  
field proper?

Chairman Terrell:

Yes, sir.

Mr. Tilley:

I represent the Rowan & Nichols Oil Company, which  
have applied for an adjusted allowable in the Castleberry

Survey in the East Texas Field, and we would like—I presume that the Commission has heard the record that has been made wherein we made that application, but, for fear it has not, and for other reasons, we would again like to re-urge our application, and we have reduced it to writing in the form of an affidavit, and we do hope that the Commission will give it proper consideration.

Commissioner Thompson:

Rule 37.

Mr. Tilley:

No, sir, Colonel. We ask for an adjustment of allowable, and, tentatively, in the event as a matter of right or law we would not have the right to demand an adjustment in allowable, then we ask, tentatively, for the granting of additional permits. We take the position that we ought to have sufficient wells to properly drain our property and properly produce our prorata part of the oil, and we don't think it necessary to get the additional wells. Nevertheless, the Commission has granted us an additional well the other day.

Commissioner Thompson:

Upon your application, was it not?

Mr. Tilley:

On our alternative application, Colonel. We insisted that we did not need any more wells; on the contrary, we urged that we could recover our fair share  
725 of the oil if permitted to do so through the wells we already have, and also proved to what we thought was our satisfaction that in adjusting the allowable and letting us recover our oil that way it would be in the prevention of waste, whereas to drill additional wells it would be conducive to waste.

Commissioner Thompson:

How many wells did you wish to drill?

Mr. Tilley:

Colonel, we have five wells on 25 acres now.

Commissioner Thompson:

You want to drill 20 more?

Mr. Tilley:

We want to drill 20 more wells if we have to in order to get what we are entitled to. The Commission has granted an alleged offset owner of approximately one-tenth of an acre a well, and we have about 250 times as much oil as he has, and we ask that we be permitted to recover proportionately on the same basis that he is.

Commissioner Thompson:

How much oil would that give your property—allowable?

Mr. Tilley:

Taking into consideration what he is getting, we would get 250 times as much as he is getting now, which would be 250 times 22 less 110. Now, Colonel, we would not ask that we be put on the basis whereby we won't be discriminated against so far as that particular operator is concerned, but we have shown, we believe, that we are being very rankly discriminated against so far as the whole field is concerned and we are being denied our fair opportunity to recover the oil.

Commissioner Thompson:

You want 250 times as much as your neighbor?

726 Mr. Tilley:

No, Colonel; we would like to have that, but, instead of that, we think that the Court can fairly and equitably take care of the situation without doing that, because we realize that you have a limit to the top allowable, and that the thing you are going to have to do is to reduce his allowable and increase our allowable.

Commissioner Thompson:

That is Brown versus Humble, isn't it?

Mr. Tilley:

That is one of the cases, but we rely not only upon Brown versus Humble and other cases involving proration orders, but we rely on fairness and equity.

Commissioner Thompson:

Couldn't we do it by cutting him down to 250ths of what he is now getting?

Mr. Tilley:

That would not relieve our situation, because we would still be suffering confiscation, because the Commission has granted so many exceptions to Rule 37 that he is not the only one who is put into the position of being discriminated against, but these other operators on smaller tracts are also taking our oil.

Commissioner Thompson:

I thought that was settled years ago—all of this.

Mr. Tilley:

I didn't think it was.

Commissioner Thompson:

You haven't heard it for a long time.

Mr. Tilley:

I think it has been settled in Brown versus Humble, but I don't think it has been settled with the Commission.

Commissioner Smith:

Rice, how much increase in the allowable of the wells you have on the 25 acres would be required to bring you up to what the well on one-tenth of an acre is now producing?

Mr. Tilley:

You mean in order to give us an opportunity to produce on the same basis that he is now producing?

Commissioner Smith:

Yes; how much would your allowable have to be increased on the wells that you have on that 25 acres now to bring you up in line with the man who has a well on one-tenth of an acre?

Mr. Tilley:

Senator, it would be 250 times 22, *inus* 110, which is our allowable for that field. If you would put us on the basis which we think we are entitled to, we would be getting approximately 240 barrels per day instead of 110.

728 The State of Texas,  
County of Travis.

I, W. E. McGuire, Official Reporter for the Oil and Gas Division, Railroad Commission of Texas, hereby certify that the above and foregoing 8 typewritten pages constitute a true, full and correct transcript of the evidence adduced and proceedings had at a Statewide hearing held by said Railroad Commission in Austin, Texas, March 19, 1938, insofar as same related to or concerned the application of Rowan & Nichols Oil Company for an adjustment in allowable; all to the best of my skill and ability. I further certify that same is a part of the

official transcript of said hearing now on file with the Railroad Commission of Texas.

In testimony whereof I have hereunto set my hand and affixed the seal of the Railroad Commission of Texas this the 24th day of March, A. D. 1938.

(Signed) W. E. McGuire,

(Seal)

Official Reporter, Oil & Gas  
Division, Railroad Commission  
of Texas.

729 Railroad Commission of Texas.

Oil and Gas Division.

Case No. ....

In Re: Application of Rowan & Nichols Oil Company for Special Permit to Drill Wells Nos. 7 to 25 on the B. C. Todd "B" Lease of 25 Acres in the W. H. Castleberry Survey, Gregg County, Texas, or an Adjustment of Allowables.

Hearing Held in Austin, Texas,

State Capitol,

May 4th, 1938, at 10:30 A. M.,

Before:

Laten Stanberry, Chief Supervisor,

V. C. Cottingham, Director of Production,

R. C. Granberry, Chief Deputy Supervisor,

Charles Lankford, Chief Petroleum Engineer.

Record Prepared by: Louise Kirk, Oil & Gas Division,  
Railroad Commission, Austin, Texas.

Appearances:

Rice M. Tilley, Trinity Life Bldg., Fort Worth,  
Texas.

A. H. Rowan, Trinity Life Bldg., Fort Worth, Texas,  
Representing Rowan & Nichols, Applicants.



J. B. Robertson, Austin, Texas,  
Representing: Shell Petroleum Corp.

J. W. Stayton, Austin, Texas,  
Representing: The Atlantic Refg. Co.

J. A. Rauhut, Austin, Texas,  
Representing: Sun Oil Co.

L. F. Burke, Longview, Texas,  
W. R. Robinson, Gladewater, Texas,  
Representing: R. M. Wood.

730 Mr. Stanberry:  
Is there any preliminary statement?

Mr. Tilley:

I would like to make this observation. Rowan & Nichols Oil Company, as it has heretofore pleaded or stated, takes the position that it only has five wells on its Todd "B" lease in Gregg County of about 25 acres. To be exact, 24.99 acres. And we take the position that in view of all the engineering testimony which we have heard adduced before the Railroad Commission and according to the testimony of all the engineers that they now have an ample number of wells to produce under the laws of this State and under the valid rules, regulations, and orders of this Commission, if they will promulgate such orders --to produce their fair share of the oil and to produce the amount of oil they are entitled to produce under the Constitution and laws of this State. We therefore urge in this hearing that an adjustment in allowable be made reducing and/or increasing some wells and especially increasing the wells of this applicant so that he will get his fair share of the oil and will be given an equal opportunity to produce his fair share of the oil. We think that is the relief which we should come here and ask

for and that is what we are asking for. Now alternatively we have asked for additional permits but we have asked for those permits and want it made clear right now that we are asking for those permits only in the event under the Constitution and laws of this State that is the remedy we have to pursue and not as an alternative either of which we would be satisfied with because we say now and want to make ourselves clear and understood that

731 we may not even drill any wells which you may grant us permits for because we already have the necessary number of wells to produce our fair share of the oil and we want permits only in the event not that you hold that we are entitled to them and should have them but in the event the Courts hold that that is the only remedy we have. And if there is any misunderstanding about it and if we don't have that right, we now want to withdraw any application we have for any relief other than an adjustment in the allowable. That is our purpose in having a hearing today.

Mr. Burke:

For R. M. Wood I want the record to show that we are not here protesting the granting of additional wells under the density theory but we are here protesting solely and primarily on the changing of the allowable of any well in any particular area other than the entire East Texas oil field and that this hearing should have been had on the entire field and not on any segregated part of the field. That is our only and sole purpose in being here. As I understand the statutory provisions of the law, if a hearing of this kind is to be heard, it must be had on the entire field and not on a segregated part thereof and I make the further objection that in the event there is any cutting of the allowable it would be in violation of the marginal well law and would cause the cutting below 20 barrels per well per day which is a statutory provision of the statutes of the State of Texas.

Mr. Stanberry:

Has anyone else anything to say?

Mr. Tilley:

I want to offer in evidence at this time—if I am misinformed I want to be corrected—the record of the previous hearing on March 11, 1938.

732 Mr. Stanberry:

It will be accepted.

Mr. Tilley:

I assume all that testimony will be considered just the same as if re-offered?

Mr. Stanberry:

It will be considered. Call your witnesses.

Mr. Rauhut:

That includes the exhibits?

Mr. Tilley:

All the exhibits.

Mr. Stanberry:

Everybody that will testify stand and be sworn please.

(Witnesses sworn.)

Mr. Tilley:

When was that Wood well actually drilled, Mr. Burke?

Mr. Burke:

In August, 1937. I believe it was completed about August 19th or 20th.

MR. A. H. ROWAN, having first been duly sworn as a witness, under oath testified as follows upon examination:

By Mr. Tilley:

Q. Mr. Rowan, you are the same witness who testified before on behalf of Rowan & Nichols Oil Company?

A. I am.

Q. Your name is A. H. Rowan?

A. Yes, sir.

Q. Do you know approximately how many permits have been granted by the Railroad Commission for the East Texas field since January 1, 1933?

A. About 766.

Q. This tract which Mr. R. M. Wood claims in the Castleberry Survey, Gregg County, what is the area of that lease? About 1 10th of an acre?

A. According to the information I have, yes, 733 sir. About 1 10th of an acre.

Q. Have you estimated approximately how much oil there is or was in August, 1937, under that tract?

A. According to the estimate which I made on my own tract of land which this is a direct offset to, it would be about 5700 barrels of oil under that 1 10th of an acre.

Mr. Stanberry:

How did you arrive at that figure?

A. I used the sand thickness and estimated it on the basis of 700 barrels per acre foot of said.

Mr. Stanberry:

How did you arrive at the 700 barrels per acre foot?

A. By calculation and the estimates of engineers.

Mr. Stanberry:

You had that estimate made by an engineer? That isn't your estimate?

A. Yes.

Mr. Stanberry:

That is the estimate an engineer furnished you?

A. That is correct.

Questions by Mr. Cottingham:

Q. How many feet did the Wood well penetrate?

A. I don't know just how much. I don't have the record on the Wood well at all.

Q. You made an estimate of how much oil was underneath it?

A. I made an estimate of the sand thickness but I don't know how much penetration he took in.

Q. Did you make an estimate of the amount of saturated sand?

A. Yes.

734 Q. What is the saturation factor which you used?

A. You mean saturated sand factor?

Q. No. The number of feet of saturation.

A. 100 feet.

Q. What was the saturation? Was all that 100 feet considered saturated?

A. About 80%.

Q. Have any of these wells in this area been cored?

A. Yes, two of the wells have. None of mine on that lease.

Q. You don't know how much—what is the maximum amount you penetrated?

A. 60 feet.

Q. Did you core?

A. Yes.

Q. What portion of the Woodbine section was saturated?

A. About 98% of that 60 feet.

Q. Of the 60 feet?

A. Yes.

Q. What saturation factor did you use?

A. I didn't use any saturation factor. I haven't heard that testimony given in the field.

Q. Did you have a permeability test made?

A. No.

Q. Or a porosity test?

A. No.

Q. You don't know the porosity or permeability?

A. No, I don't know the porosity or the permeability either. You mean by laboratory tests?

Q. Yes.

735 A. No, sir.

Q. How did you arrive at 5700 barrels under the Wood well as of what date? August, 1937?

A. August, 1937. I used the factor of 700 barrels per acre-foot, originally under my lease, and I calculated from that—taking from that 13,000 barrels which we have taken per acre out of our lease which would give us a total recovery of 5700 barrels.

Q. How did you arrive at 700 barrels?

A. From the estimates of engineers.

Q. That wasn't your estimate?

A. No, it wasn't.

Q. Do you know what porosity they used?

A. No, sir, I don't.

Q. Do you know the permeability?

A. No, I don't.

Q. The saturation factor of the saturated portion of the Woodbine section?

A. No, I don't.

Q. Do you know anything about the water content of the Woodbine sand?



A. Nothing except what I have read.

Q. You don't know under the Wood tract whether there is any shale or the portion that it is set on—

A. I don't know anything about the sand conditions under the Wood tract except as they are related to the sand conditions under the tract offsetting it and

736 to the tract to the south, which is the Shell's Bassham tract. One of the wells on the Shell's Bassham lease cored about 90 feet of sand and while I didn't look at all the cores, I looked at most of them.

Q. Do you know what portion of the Woodbine section is saturated or what portion is volcanic ash and what portion is shale?

A. I would say that most of it is sand. There is very little shale.

Q. Could you say definitely from observation in taking the cores out?

A. From observation I have had I would say most of it is sand.

Q. Did you come to that conclusion from looking at them or putting them to laboratory tests?

A. From just looking at them.

Q. That is all.

Questions by Mr. Tilley:

Q. You are a practical oil operator?

A. Yes.

Q. You have drilled any number of wells in the East Texas field?

A. Yes.

Q. You have personally supervised the drilling of these wells?

A. Yes.

Q. Have you attended a large number of the Railroad Commission hearings in which Mr. Cottingham, Mr. Gordon Griffin, and various engineers of the Railroad Com-

mission and other engineers have testified with reference to the East Texas field?

A. Yes.

737 Q. Have you made a very thorough study of the sand conditions over there and the permeability and porosity and water drive and gas in solution and all the factors which would go to the amount of oil content in the reservoir and the producing conditions over there in the East Texas field?

A. I would say this: I have read as much information on the field as I could procure.

Q. Has that been substantial?

A. I think it has, yes, sir.

Q. The information which you have testified about here in response to Mr. Cottingham's questions, of course that information—does your opinion corroborate the information you have?

A. Yes, sir.

Q. Mr. Rowan, does it make any difference whether the reservoir content per acre of the Wood lease is 5000 or 15,000 or 1500? Will the discrimination exist just the same?

A. I think so. I think if you use the same factor on his lease as you use on my lease, you would have the same relative discrepancy.

Q. Do the same conditions exist there under his alleged lease as exist under yours.

A. I don't think there is any question but that they are the same.

Q. Have you ever heard any engineering testimony which would indicate otherwise?

A. All the testimony and information which I have on this particular area is that conditions are reasonably and fairly uniform, the underground conditions.

738 Q. In reference to the sand conditions and permeability and porosity in this lease as compared with each of the other leases in the field.

will you state whether it is better or worse than the average?

A. I would say ours is better.

Q. Therefore regardless of what the sand conditions are under your lease and the permeability and porosity, since the East Texas field is a common reservoir and since the conditions under there which I have just mentioned are fairly uniform, it would make little difference whether you knew the exact permeability or porosity because the discrimination would still exist.

A. I think it would exist.

Q. And you still would suffer drainage?

A. Yes, sir.

Q. You have testified that there was under Mr. Wood's tract approximately 5700 barrels of oil when his well was drilled in August, 1937. That well was drilled somewhere between the first and 20th of August, 1937. It was on production then, according to their information. Now have you figured up just about how much oil that well has produced since that time up to the present time.

A. Using the Railroad Commission allowable, and I assume that the well has produced its allowable production during that period of time, it would have produced about 5400 barrels.

Q. Then within only two or three months that one well will have produced all the oil which you estimate underlaid it at the time the well was put on production.

A. That is correct.

739 Q. Will your wells come anywhere near having produced the amount of oil which underlaid them at this time?

A. No, sir.

Q. Mr. Rowan, the present allowable for your wells is what? On your "B" lease.

A. About 22 barrels.

Q. And he has the same, Mr. Wood has the same?

A. Yes, sir.

Q. Mr. Cottingham, may I ask you a question?

Mr. Cottingham:

I am not a witness. I am assisting in holding the hearing but if there is anything I could help you on, I would be glad to do it.

Mr. Tilley:

I want to know what the maximum daily allowable is in the East Texas field.

Mr. Cottingham:

25.96 barrels.

Mr. Tilley:

How many wells have over 22½ or 23 barrels.

Mr. Cottingham:

I would have to look on the schedule. It is available to you, the same as to me.

Mr. Tilley:

There would be very few wells? Do you have that schedule?

Mr. Cottingham:

I don't have a schedule with me.

Mr. Tilley:

Will you have your stenographer copy that information and put it in this record at my expense?

Mr. Cottingham:

You can put it in later on.

Mr. Stanberry:

I have a schedule here if you want it.

Mr. Tilley:

I can insert it later to save time.

740 Mr. Raubut:

Is that the whole allowable schedule?

Mr. Tilley:

No, I just want to know how many wells have allowables of 23 barrels in East Texas. Mr. Rowan, what do you figure is the per acre recovery per day with your five wells on your 24.99 acre lease? Your per acre allowable per day.

A. 4.4 barrels.

Q. 4.4 barrels?

A. Yes.

Q. What does Mr. Wood's figure?

A. Using  $1/10$  of an acre, he would have 220 barrels, at the rate of 220 barrels per acre per day.

Q. Do you have an equal opportunity to produce from that reservoir with him?

A. No, sir.

Q. Do you have an equal opportunity to produce with other wells in that field?

A. No, sir.

Mr. Cottingham:

May I interpose? What is the density of the Continental Oil Company's B. C. Todd lease immediately north of your Todd "B" lease?

A. I am pretty sure it is 1 well to 5 acres.

Mr. Cottingham:

Is that more or less than the density of your lease?

A. It is same as the density of my lease at this time.

Mr. Cottingham:

What is the density of the Arkansas Fuel Oil Company's Joe Stephens lease that corners you on the northeast?

A. I don't know.

741 Questions by Mr. Stanberry:

Q. In addition to these five wells on your lease you have another permit granted, haven't you?

A. One permit has been granted, yes, sir. But the location of it is so vague and indefinite we would have to just go out and drive a stob and drill where we wanted to.

Q. Why is it vague?

A. It says equidistant from Mr. Wood's well.

Q. Don't you know where Mr. Wood's well is?

A. I don't know where the line is.

Q. Couldn't you locate his line?

A. I haven't been able to locate it, no, sir.

Q. Isn't it a fact that you have a suit filed on the whole south end of your strip here?

A. There is a suit filed but I can't tell what he is claiming.

Q. You can't locate this line?

A. No, sir.

Q. Why?

A. Because my engineer says it isn't there. Our engineer says that our line intersects with the Bassham tract owned by the Shell.

Q. Has that 1/10th of an acre tract been litigated?

A. Yes.

Mr. Rauhut:

Was that title litigated?

Mr. Tilley:

No. We haven't tried the title. We have a case in the Federal Court involving that title or rather Shell has.



742 Mr. Cottingham:

Do you know the density of the Magnolia Petroleum Company's H. L. Foster lease to the west of your Todd "B" lease?

A. No, sir.

Mr. Granberry:

Hasn't the Wood tract been litigated in the Lower Court?

Mr. Tilley:

Just the permit and not the title.

Mr. Granberry:

I understood that title had been litigated.

Mr. Tilley:

It was to some extent as to whether there was a bona fide title dispute but our pleadings especially showed we were not litigating title but set up enough information as to show a bona fide title dispute.

Mr. Robertson:

And the Court in the judgment specifically disclaimed any adjudication of title in that case.

Mr. Cottingham:

Do you know the density of the Atlantic Refining Company's H. L. Foster lease to the southwest?

A. No, sir.

Mr. Cottingham:

Do you know the density of the Sun Oil Company's Allen Tooke lease to the south?

A. No, sir.

Mr. Cottingham:

Of the density of the Shell's R. L. Bassham, et al. lease?

A. No, sir.

Mr. Cottingham:

Or what relationship your density bears to any of these leases?

A. I think it is about the same. I think we are all drilled in this area to about the same density. Directly north of the Todd tracts there are several leases 743 which are drilled to a lower density than we are drilled to, about 1000 or 1500 feet north of our tract.

Mr. Granberry:

I believe there is a density statement in the Rule 37 file which was entered at the former hearing. That statement shows that the 8 times area is drilled to the same density as the applicant. There is also an offset lease density statement in the file.

Mr. Stanberry:

Does this density statement show that the 8 times the size of the applicant's tract is drilled to the same density as the Rowan & Nichols tract is drilled to at this time, including the well on the .1 of an acre tract?

Mr. Granberry:

Yes.

Mr. Cottingham:

The Rowan & Nichols lease has the same density as the surrounding 8 times the acreage surround it?

Mr. Granberry:

That is what this statement shows. The statement further shows that the average density of the offset leases is 1 well to 5.588 acres.

Mr. Cottingham:

What is the density of the Rowan & Nichols Todd "B" lease? How many acres do they have?

Mr. Granberry:

25 acres.

Mr. Cottingham:

And have five wells and one permit?

Mr. Granberry:

Yes.

Mr. Cottingham:

Q. What density would that make you, Mr. Rowan?

A. A little over four; about  $4\frac{1}{2}$ .

Mr. Cottingham:

About 4.25?

A. A little less than that.

744 Mr. Cottingham:

It would be 4.16 acres. Your lease has a greater density than the average of the leases surrounding you? Is that right?

A. I am not going to testify to that. It may be so. Assuming that statement is true, yes.

Mr. Cottingham:

You haven't made any calculations to determine whether that is true or not?

A. No, sir. I wouldn't undertake to say what that density was with reference to the surrounding leases at all.

Questions by Mr. Tilley:

Q. Mr. Rowan, Mr. Cottingham has just asked you some questions ..... density on the adjacent leases. By density of course you mean the number of holes drilled to the production horizon; isn't that right?

A. I think that is what he means.

Q. That is what you mean, isn't it, Mr. Cottingham?

Mr. Cottingham:

The number of wells on the offset leases surrounding the applicant's lease.

A. The number of wells and the relationship of the number of wells to the total acreage.

Q. That is what you mean by density?

A. Yes.

Q. Mr. Rowan, has the number of holes over there on your lease when there is a density of greater than 1, well to 10 acres—does that have any relation or bearing whatever in your opinion to the amount of oil which you are entitled to recover if your hands are being tied with a prorated allowable order?

A. I don't think so.

745

Q. Can you conceive of any bearing that it has to your right to recover your fair share of the oil?

A. I wouldn't think so, no, sir.

Q. What are you entitled to over there? What factor is essential? The number of holes, the pressure in the oil reservoir, or what is the factor or factors which go to your right to recover your fair share of the oil and your right to have an equal opportunity to produce with everybody else in the field?

A. I think that the amount of recoverable oil which we have and the relationship that bears to the total recoverable oil in the field is a factor which should be used and is the paramount factor in any proration order.

Q. Mr. Rowan, if these adjacent leases in the area of a half a mile of your lease were drilled to the same density that you were drilled to, would that in any way affect your right to produce your fair share of the oil if others outside of that area were draining oil from the same general reservoir? Do you understand the question?

A. No, I don't.

Q. Mr. Cottingham has indicated here by his questioning that you have no right to complain—

Mr. Cottingham:

I haven't indicated that but was just questioning him.

Mr. Tilley:

Your questions are subject to that implication.

Mr. Cottingham:

I was just asking to determine what his reaction was to my questions.

746 Mr. Tilley:

Then I will ask this question. At least remotely guessing that Mr. Cottingham's inquiry or questioning was that your answer thereto would imply that if your lease was drilled to the same density as the adjacent leases that you would not be suffering drainage and would not be having your legal rights impaired in any way. Is that true or not true?

A. I don't think that even if the lease was drilled to the same density as the surrounding leases or an area 8 times that area that that is a factor which should be con-

clusive that we are getting our fair share of the oil. We think that the field should be considered more as a whole and the amount of oil we have under our reservoir should be considered in relation to the total amount of oil under the reservoir as a whole.

Q. Then the regular spacing and uniform spacing of wells in that immediate area of your lease and the immediate adjoining acreage has no relation to your equal opportunity to produce in that field or your right to produce your fair share of the oil?

A. No, sir, not under proration.

Mr. Cottingham:

Before we get off that point, may I ask a question?

Mr. Tilley:

Yes.

Mr. Cottingham:

How many acres are proven in the East Texas field?

A. Somewhere between 126,000 and 130,000 acres, according to the best information which I have.

747. Mr. Cottingham:

How did you arrive at the conclusion which you have submitted to Mr. Tilley that you weren't getting your fair share of the field allowable?

A. We took the evidence of the sand thickness as compared to the average sand thickness under our lease.

Mr. Cottingham:

What is the average sand thickness in the field?

A. In the field? Probably about 42 feet.

Mr. Cottingham:

Did you make any calculation to determine it?

A. The average sand thickness according to the information I have is 42 feet. We have about 60 feet.



Mr. Cottingham:

Did you make those calculations or were they made by somebody else?

A. By somebody else.

Q. Go ahead and tell him what your engineer based his calculation on. The acreage was 126,200; is that right; and your acreage as compared to that was 24.99 acres.

A. The percentage of our total acreage using 126,200 acres was .0199.

Q. And the average sand thickness of the East Texas field was 40 feet.

A. We estimated the average sand thickness was 40 feet.

Mr. Cottingham:

For the entire field?

A. Yes.

Q. The sand thickness of the entire field was what?

A. We estimated our sand thickness as 100 feet.

Mr. Cottingham:

How did you arrive at the productive part of the East Texas field? Do you know?

748 A. The productive part?

Mr. Cottingham:

Yes.

A. I think it was arrived at by taking a planimeter and running around the outside of the field.

Mr. Cottingham:

Did you divide the area between the producing wells and the dry holes or run from producing well to producing well?

A. He ran from producing well to producing well.

Mr. Tilley:

He didn't take in the acreage which was condemned.

Mr. Cottingham:

If your calculation were to be correct, you would take a line more finely calculated than drawing it from producing well to producing well.

A. I assume that the field has been drilled up on the east and west. I would think so.

Mr. Cottingham:

Aren't they continuously making extensions of the East Texas field?

A. They may be but on the information we have now we only have to assume that the acreage if productive is the limits of the field at the present time.

Mr. Cottingham:

That is what you based your calculations on?

A. Yes, sir, that is the known proven acreage.

Mr. Cottingham:

Is your engineer who made these calculations present?

A. No.

Mr. Tilley:

No, he isn't present.

749 Mr. Cottingham:

You don't know how many cores he analyzed to arrive at that conclusion or whether he took the drillers' logs.

A. No, sir, I don't. Some of the information we based on the Hudnall map of the sand thickness and other information we based on the best information we could obtain in the field. You understand, Mr. Cotting, that there are 25,000 wells and that it is a pretty big job to

analyze every well separately but the Railroad Commission has the information on file to substantiate or correct these estimates. The point is that we take the position that there is a yard stick that could be used for the entire field. Having arrived at that yard stick and having arrived at that measure you could apply that measure to us and every other lease in the field and then you would do substantial equity between leases in the field.

Mr. Cottingham:

Would you go on the bases of acres or acre feet?

A. On the basis of acre feet of sand thickness.

Mr. Cottingham:

Does every acre foot have the same value in the East Texas field?

A. Not exactly but substantially the same.

Mr. Cottingham:

Does the condition of permeability and porosity have anything to do with the amount of oil in place?

A. It enters into the amount of—the condition of porosity does have a relation to the amount of oil in place. The condition of permeability has a relationship to the amount of recoverable oil.

Mr. Cottingham:

You used the recoverable oil?

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A. Yes, sir, and I think that potential is the measure of permeability.

Mr. Cottingham:

And not a measure of the amount of oil in place?

A. No sir.

Mr. Cottingham:

You might have a big well that would have a higher potential but less oil surrounding it than one which would have a lower one.

A. That is possible.

Mr. Cottingham:

And, the big well wouldn't in your judgment—it wouldn't necessarily follow that a big well would have more recoverable oil?

A. Not necessarily unless you used that as a factor. It certainly measures the permeability.

Mr. Cottingham:

That is all.

Questions by Mr. Tilley:

Q. Mr. Rowan, this information which you have based these deductions and figures from is the same information that is assembled and some of which is in the presence of the Railroad Commission and that other engineers used in making estimates and statistics.

A. I think, Mr. Tilley, that the East Texas field has been drilled up to the point where there is all the information available to the Railroad Commission which they need to determine the thickness of the sand and the porosity of the sand and the permeability of the sand.

Q. You think they have ample information right now to make an adjustment in the allowable if they wanted to make that adjustment?

751 A. I do.

Q. And Mr. Cottingham's testimony and his contour maps and the various maps substantiate the figures you have gotten up?

A. I haven't seen any of his maps—

Q. The Railroad Commission's maps. You have been at the proration hearings for some three years?

A. Yes.

Q. Haven't you seen the sand thickness map and the contour maps introduced in evidence by the Railroad Commission?

A. Yes, I have seen them. They substantiate that to a great extent.

Q. Is there any real difference between the opinion of your engineer and the others as to the permeability and porosity and sand thickness of any general area in the East Texas field, any substantial difference?

A. I have never heard of any real difference.

Mr. Cottingham:

In that connection, how many permits have you asked for, Mr. Rowan, on this 25 acre tract?

A. On the 25 acres?

Questions by Mr. Cottingham:

Q. Yes.

A. I have asked if I would not be given an adjustment in allowable that I be given 20 additional wells. That would make twenty-five. That includes No. 6.

Q. That would make 25 wells?

A. Yes.

Q. You said that the sand thickness in this area you thought was 100 feet?

A. Yes.

752 Q. And then you said that the average was 42 feet?

A. 42, yes, sir.

Q. If the Commission has granted you 25 permits and you drilled to that density would that put you out of balance with the rest of the field at the present time?

A. At the present time taking the field as a whole?

Q. Yes.

A. Yes, sir.

Q. You have asked for more than you think you are entitled to?

A. No, sir, because they are still granting permits. They are still drilling wells over there. If the thing keeps on, I might have to drill more than 1 well to 1 acre.

Q. The basis of your testimony just given that you thought you had 100 feet of sand and that you thought there was a direct relation between the amount of sand thickness and the per acre foot to the amount that a well was entitled to—I believe you said that, didn't you?

A. Yes, I said that.

Q. If that is true, then you would have only a relation of 42 to 100, wouldn't you, under the present conditions?

A. I don't see how you could take that relationship in the drilling of holes.

Q. I am wondering—I have no opinion about it but I am just wondering if you had 100 feet of sand in this area and the whole field has 42 and you testified that the reason you didn't think you were permitted to get your fair share of the oil was because you had 100 feet and 753 you thought the whole field should be on a comparable basis.

A. I think that each lease should stand on its own feet. That average of 42 feet takes into consideration that on the west side there are wells producing oil from probably one or two feet of sand thickness, saturated sand thickness, and on the east side there are wells producing from one or two feet of sand thickness, and I think that the thickness of the sand under each lease should be taken into consideration, and that the lease should be given its fair share of the oil, the recoverable oil.

Questions by Mr. Stanberry:

Q. There is a lot about this I don't know. You say you have two feet of saturation on the west side and two feet of saturation on the east side or three or four feet. Are those two leases then entitled to the same amount of oil?

A. Using the basis of acre feet of saturated sand thickness only, they would be.

Q. How much longer will wells on the east side produce than wells on the west side?

A. They will probably produce fifty times as long, just guessing.

Mr. Tilley:

Q. You mean the extreme west and the extreme east, Mr. Stanberry?

Q. Yes, where you have four feet of saturation, say. The ones on the extreme east will probably produce about fifty times longer?

A. Yes.

Q. Is that a fair measure of the amount of oil that they are entitled to recover then?

A. No, sir.

754 Q. So it just doesn't work out all the time?

A. It will not work out if you use that factor alone. Maybe I should qualify that statement.

Questions by Mr. Tilley:

Q. Mr. Rowan, you don't mean to imply that it should be put strictly on a sand thickness basis, do you?

A. No.

Q. Mr. Cottingham has asked you some questions about—with reference to the number of wells you have applied for, Mr. Rowan. How many wells have you estimated it would take immediately, right now, to put you on a parity with the other wells in the field so as to permit you to produce the amount of oil daily which you think you are entitled to produce?

A. Right at the present time?

Q. Yes.

A. I think it would take six more wells.

Q. But you have applied for 20 additional wells?



A. Yes.

Q. You have been suffering a loss of oil here for some extent for some extended period of time, more than three years?

A. Yes, sir.

Q. This is the second time you have asked for this same relief?

A. Yes.

Q. You were here three years ago asking for the same relief, weren't you?

A. Yes.

755 Q. Did you get it?

No, sir.

Q. Did you have to go to Court?

A. Yes.

Q. What did the Commission do then?

A. About an hour before case was called for trial they granted the permits.

Q. You gave up your remedy for an adjustment of the allowable and took the permits?

A. Yes.

Q. Did that put you on a parity with the other wells in the field as far as an equal opportunity to produce the oil was concerned?

A. No, sir.

Q. Have you been losing oil since that time?

A. Yes.

Q. If you drill six wells, at the rate the Commission is granting additional permits, how long do you think you would be on an equal parity if you didn't have the other wells?

A. Not very long.

Q. Why?

A. Because as more wells are drilled and the density in the whole field becomes greater, I am losing my opportunity to produce oil.

Q. With the line of march that the Railroad Commission has created in granting permits since the discovery of the field, and assuming that curve will remain constant until the point is reached where it will be unprofitable to drill in the East Texas field would the granting of these additional permits by the Railroad Commission, if you were granted these six wells right now, would that inside of a year or two years put you right back where you are now?

A. I think it would put me back, yes, sir.

Q. In other words, what you would have then would be to invest about \$70,000 or whatever six wells would cost, and then you would be in the very same place you are now, wouldn't you?

A. Yes, sir.

Q. Then that isn't the relief you seek then, is it?

A. No, sir, that isn't.

Q. Why isn't it the relief you seek?

A. Because I think I have enough wells to properly drain my lease under proration and I think that I am entitled to recover my fair share of the oil without drilling any additional wells and without being put to that additional expense.

Q. You don't think you should be forced to spend your money to get the thing you are already entitled to?

A. No, sir.

Q. In other words, suffer confiscation in order to prevent confiscation?

A. That is right.

Q. Now, if you get six more wells or 20 more wells, unless the Railroad Commission holds down the permits of other operators in the field or adjusts the allowable, you are then in the same position two or three years from now that you are in now?

A. Yes, sir.

Q. Therefore that isn't an adequate remedy or relief for you?

A. No, sir, I don't think so.

Q. You are familiar with the East Texas field and the drilling program over there, aren't you, and the density of the wells throughout the field?

A. Yes, sir.

Q. Aren't there any number of wells over there where small tracts have less than your density, less than 5 acres?

A. Yes, sir.

Q. That condition exists throughout the field?

A. Yes, sir.

Q. On a large plan?

A. Yes, sir.

Q. Those wells are draining from the same reservoir you are draining from?

A. Yes, sir.

Q. It doesn't make any difference if they give you and your adjacent lease owners a certain allowable, unless it bears some relation to those other wells, then you are still being drained?

A. I think so.

Q. How many barrels a day have you estimated you should get a day under the present allowable of approximately what? 450,000 barrels?

A. I think using the reservoir acre foot of sand thickness that we should get 236 barrels a day.

Q. And using an allowable of about 500,000 barrels?

A. Yes, sir.

Mr. Cottingham:

How many per day?

758 A. 236.

Mr. Cottingham:

236 barrels daily?

A. Yes. 236 barrels per day on that 25 acre lease.

Mr. Cottingham:

And how much are you getting now?

A. I am getting a little better than 110 barrels a day now, Mr. Cottingham.

Q. How much would you get on a straight per well basis with your present number of wells?

A. A straight per well?

Q. Yes.

A. Without taking into consideration—

Q. If the East Texas field were on a per well basis how much would you be getting right now? On a 100% well basis.

A. I would be getting 101 barrels.

Q. If the old order stricken down by the Federal Court were in effect you would be getting 101 barrels and as it is now, you are getting 109?

A. I am getting 110. There would be 9 barrels difference.

Q. The East Texas field then is practically on a per well basis now?

A. Yes, sir.

Q. If there never had been any proration in the East Texas, would you have been—did you drill your wells in such time as you would have been permitted to get your fair share of the oil?

A. Yes, sir.

Q. You drilled your wells right in the early part of the life of the field?

A. Yes, sir.

Q. Did you drill them in accordance with the rules and regulations of the Railroad Commission with reference to the spacing of them?

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A. Yes, sir.

Q. When did Mr. Wood drill his well?

A. Not until about August, 1937.

Q. About six years later?

A. Yes, sir.

Q. If there had been no proration in East Texas there wouldn't have been any oil left under the Wood tract, would there be now? Not enough to justify drilling a well?

A. There might have been some oil but certainly under unrestricted flow—

Q. No reasonably prudent man or operator would have drilled a well there, would he?

A. I don't think so.

Q. The Railroad Commission has tied your hands for six years and then let Mr. Wood come in six years later and produce on a per well basis practically the same as you are producing?

A. Yes, sir, that is right.

Q. Was there anything to keep him from drilling that well?

A. Not that I know of.

Q. Did you ever hear Mr. Wood make any claim to that well until about eight months ago?

A. Not until just before he filed application for the permit.

Q. This four acre tract or practically four acre tract which he has filed suit against you on in Gregg County, the petition in which he entered in evidence at the last hearing, how long have you been in possession  
760 under your oil and gas lease including that tract and producing oil from it?

A. Better than six years.

Q. You have been paying taxes on it?

A. Yes, sir.

Q. And have been in possession of it?

A. Yes, sir.

Q. Has anybody ever made any claim to that tract until about six or eight months ago?

A. No.

Q. Did Mr. Wood ever come to you and say that was his tract?

A. No, sir.

Q. Did you ever see him on it?

A. No.

Q. Did any of your men ever hear of him coming over there?

A. No, sir.

Q. How long have the Todds or their ancestors been in possession of this 4 acre tract filed suit on under fence and paying taxes on it over there?

A. There are affidavits from old people in the neighborhood showing that he has been in possession of the land for fifty years.

Q. Have you talked to Mr. Todd about this case?

A. No, sir, I haven't talked to him.

Q. You haven't talked to him about that boundary dispute?

A. Not personally.

Q. Now, Mr. Rowan, even if you were on a strict potential basis of a well alone, what would you be getting a day?

A. Based on 500,000 barrels a day allowable I would be getting about 160 barrels.

Q. That shows that your potential is substantially better than the average in the field?

A. Yes, sir.

Questions by Mr. Stanberry:

Q. What relationship is there between potential and the amount of oil under your lease?

A. I don't think there is a whole lot, except that potential indicates to a certain extent the recoverable amount of oil. It indicates the permeability and you have to have permeability in order to get the oil out.

Q. Is there any relationship between the potential and the amount of oil in place under a lease?

A. No, no direct relationship, I don't think.

Q. Then you think that potential is the thing which should be given very much consideration in fixing allowable under a lease?

A. I think it should be given consideration.

Q. How much?

A. I don't know. That is an engineering problem. I don't know. I think it should be given some consideration. It indicates permeability and without permeability you can't get the oil out even if it is in the reservoir.

Q. Doesn't permeability indicate more the rapidity with which you can recover it than the amount of the oil to be recovered?

A. It indicates rapidity.

Q. Does it have any relationship or much relationship to the amount to be recovered where you have a water drive?

A. No. I don't think it does.

Q. It just indicates the rapidity with which  
762 you can recover it?

A. Yes, and of course with a highly permeable sand you will get a greater per cent of the oil in the reservoir out than in a tight sand or less permeable sand.

Q. If you have a low permeability sand and have a water drive like in East Texas and you withdraw it slowly, don't you recover about as much as if the sand were permeable?

A. I believe you would under a low rate of recovery. I believe you would get it.

Questions by Mr. Tilley:

Q. I didn't understand the question asked in relation to the bearing that potential has. What was your answer?

A. I said that potential had a relation to permeability but that it doesn't necessarily indicate the reservoir content of the oil under a lease.

Q. Does potential have any relationship to water drive or gas in solution?



A. It has a relation to pressure. Water drive is pressure.

Q: Then if you are favorably situated by virtue of the pressure which you have and reservoir energy, then that is represented in the potential?

A. Yes, sir.

Q. And permeability is represented in the potential?

A. Yes, sir.

Q. If you even take potential alone—you are using the potential that is used by the Railroad Commission?

A. Yes.

Q. If you take potential alone then you are suffering confiscation now because if you take it alone and put it on a well basis you would have 160 barrels per day under the present allowable?

Mr. Rauhut:

For the lease or per well?

A. Per lease.

Mr. Stanberry:

He said that potential had very little relation to the amount of recoverable oil under your lease.

Q. That is what I want to clarify. I don't think he meant that. It has some bearing, of course.

A. I didn't say the amount of recoverable oil. It isn't a measure of the amount of oil under your lease in place. But it does have a relationship to the amount of recoverable oil.

Mr. Stanberry:

Didn't you testify that if you had a water drive and made your withdrawals slowly you would get about the same per cent of withdrawals assuming the same porosity

for the sand in one that was not permeable as one which was permeable?

A. I said I believed you would.

Q. You said, I believe, that you had a water drive—if you had a water drive, that wouldn't vary your potential very much, didn't you? Whether you had a tight sand or a loose sand?

A. No, I didn't say that.

Q. What did you say?

Mr. Stanberry:

He said it wouldn't affect the ultimate recovery much.

A. I said under a very slow rate of withdrawal the sand—you might get all your oil out of your reservoir even though this lease over here didn't have the permeability that this lease over there had because your water  
764 drive would have a tendency to force it out under a very slow rate of withdrawal.

Q. You mean an even and uniform rate of withdrawal?

A. Yes.

Mr. Cottingham:

Do you believe that slow rates of with..... from the common reservoir where you have an active water drive will ultimately result in more production?

A. Yes, sir.

Mr. Cottingham:

You stated that under the potential factor if that was the only factor you would be entitled to 160 barrels?

A. Yes.

Mr. Cottingham:

If the potential of the Wood well is equal to the average potential of your wells, under potential what would he get?

A. He would get the same allowable as mine with the potential factor only.

Mr. Cottingham:

How many barrels would that be.

A. It would be 5 into 160; 32 barrels.

Mr. Cottingham:

On a strictly potential basis there would be discrimination as against your lease?

A. Yes. That is correct.

Q. Then under potential alone you are being discriminated against to the extent of about 50 barrels a day on that one lease and considering acre sand feet thickness—acre feet of sand thickness—alone, which you don't suggest, you would be suffering a discrimination of about 126 barrels a day?

A. That is correct.

Q. And under a combination of the two, whatever that combination might be, you would be suffering a greater discrimination than you would be under the straight potential basis?

A. Yes, sir, I think there is more than one factor which should be used in any proration order in East Texas.

Q. Have you ever heard any engineers argue—

Questions by Mr. Stanberry:

Q. Ask him what all the factors are which should be considered. You said you thought more than one factor should be considered. How many factors do you think should be considered?

A. I think that acre feet of sand thickness is a very important factor because it tells you what—it gives the amount of oil in place under each lease and I think that potential is another factor which should be considered

because it indicates the rapidity with which that oil could be taken out while the permeability which would be similar to open flow conditions—

Q. You think if you had a lease and I had a lease beside it and assuming the same porosity and the same sand thickness, because your well happened to be in a more permeable formation than mine, do you think you are entitled to a bigger withdrawal than I am?

A. I do.

Q. Why?

A. Because under open flow conditions I would get more oil. If you would take the restraining hand off of me and the government washed its hands of proration and there weren't any laws on it and let me go ahead and drill my wells and produce my oil as we used to do, I think that I would get more oil than that neighbor.

Q. If you take the policeman off the beat, I  
766 could go to the bank and get more money than I can now. But as an equitable matter assuming we have the same amount of oil under my lease and just because your lease happens to be a little better than mine or your wells happened to be deeper than mine and take in more sand, if we drilled under better field practice than you did, do you think that you should have a bigger allowable than I should have because you drilled your wells wrong than I do because I drilled mine right?

A. Yes, I think you should give the advantage to experience in the oil business just like you should any experience in any other line of commercial activity.

Q. If I drilled mine right and you drilled yours wrong, don't you think that potential as a proration factor and especially in a producing horizon with water underlying it like in Conroe and anywhere in the Gulf Coast where you drill as much of your sand as you can to get as big a potential as you can—don't you think that is bad field practice?

A. Yes, to drill that amount of sand and take an open flow potential. I think it is bad practice.

Q. But in your potential plan you would reward a man for bad field practice, because he drilled more of the sand and got a bigger potential?

A. Not necessarily.

Q. If you take potential as a proration factor you would.

A. Evidently the Railroad Commission doesn't think that because they use a 100% potential factor in East Texas. The questions you are asking would indicate that the Commission is making a very serious mistake in using the potential factor because they aren't even taking the potential under restricted flow but under wide open flow.

Q. I am asking you if you don't think you would make a mistake—

A. I don't think they would make a mistake in East Texas. I think it would be a very serious mistake to open wells on the west wide open because oil would be trapped in place which would never be recovered.

Q. If you have two wells in identically the same formation and say I drilled in 20 feet of sand and you drilled 80 feet of sand, and you got a considerably bigger potential than I did just because you drilled your well deeper, do you think that you are entitled to a bigger daily allowable than I am?

A. What is to keep you from drilling your wells on down?

Q. Because I wouldn't want to drill closer to the water and take that chance on it.

A. I think that experience in the oil business and management should be rewarded. In my own case over there we have a well west of us that is taking in 100 feet of sand, 100 feet of productive formation. We have a well south of us which is taking in 90 feet and I have just testified I only took in 60 feet.

Q. I think your wells are finished the best.

A. Notwithstanding that fact, I was willing to take the potential of my well and let the Railroad Commission use it as a key well. While it isn't the biggest in the field, it is a good well with 60 feet of sand.

Q. Do you think your well is finished in better shape than those drilled to 100?

A. If I didn't, I would drill deeper.

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Q. Just because he drilled nearly twice as much sand as you did, do you think he should be entitled to twice the allowable?

A. I don't think you should put a reward on drilling deeper to get a bigger allowable.

#### Questions By Mr. Cottingham:

Q. As to sand thickness, you said you thought sand thickness should be one of the factors in the East Texas field?

A. Yes.

Q. Where do you get the water drive in the East Texas field?

A. It used to be around minus 3300 feet. I don't know what it is now.

Q. It used to be 3320 minus 3320.

A. I believe that is correct.

Q. It was 3320 feet below sea level?

A. Yes.

Q. The general practice since there were a few wells in the field on the west side—what has been the general practice with reference to penetrating sand on the west side?

A. I think the general practice has been to stay above that water level.

Q. How far?

A. As far above it as they could possibly stay in order to get an amount of sand so that the well would produce



by flowing methods, taking in just as little sand as possible on the west side.

Q. Do you know—would you calculate the sand thickness in those areas for the factor?

A. Yes.

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Q. How would you go about doing it?

A. I would go about doing it by calculating the water table and taking the distance between the top of the sand and the top of the water table.

Q. Would you assume all that section you estimated was saturated or would you assume that 20% or 40% or 50% or 100% was saturated? How would you calculate it?

A. I think the Railroad Commission should have an engineering force that is capable of calculating it. You can run permeability tests and tell where the shale is. That is, a Schlumberger test.

Q. You can't run a Schlumberger on a well that isn't drilled.

A. But you can run them on the wells that are drilled and tell where the water comes in and where the shale is. In the absence of any information to the contrary I would certainly assume that that sand was saturated.

Q. The entire section of the Woodbine sand?

A. Yes, sir.

Q. In your calculation of 60 feet did you assume all 60 feet was saturated?

A. Yes, I put it all in the same category.

Q. Do you know the character of the Woodbine formation? Is it made up of all sand?

A. No, sir.

Q. But you applied all saturation to it.

A. The shale content isn't uniform and I would say that if you took the top of the sand as the basis and the base of the sand and used that as the sand thickness, I would say over the entire area of the field you would be doing substantial justice to all leases

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because the amount of shale in the sand will run just about uniform over all the entire field.

Q. Is there any other content other than sand and shale in the Woodbine?

A. There is some ash.

Q. Does it carry oil?

A. I don't know whether it does or not. I have heard it does carry some oil.

Q. What is the thickest continuous ash deposit you have encountered in the Woodbine section?

A. I don't know offhand. I know we drilled and cored some ash.

Q. What is the thickest shale section you have drilled?

A. I would say two or three feet.

Mr. Stanberry:

Is that solid ash or just streaks of ash through shale?

A. I think it is solid. It comes in layers.

Q. You think it is continuous throughout the field?

A. No, sir.

Q. Is it lensing?

A. Yes.

Q. If you pick up volcanic ash and shale in one well, does it necessarily follow you will pick it up in the offset well?

A. Not necessarily. Mr. Cottingham, no, sir. But I think that any order you used would give substantial equity. If you assume that all the sand was saturated, I think you would be doing substantial equity between the lease owners. I am not going to say—

771 Q. Would you trade acre foot for acre foot of your lease with some in the south end?

A. No.

Q. Why?

A. Because my pressures are higher.

Q. In the beginning of the field, in the early history of the field, would you have traded with the pressures the same?

A. I don't know, Mr. Cottingham. We didn't do much work in the south end of the field. I haven't drilled very many wells further south than the London townsite area and I don't know the conditions down there very well.

Q. If you go purely on pressure would you rather have a per acre sand foot over next to the water line or where you are now?

A. Acre foot? I would rather have them where I am now.

Q. Why?

A. Because I will get more recovery.

Q. You think over in the fairway, as indicated in your petition it will yield more oil than over on the west side?

A. Yes, sir.

Q. Per acre foot?

A. Per acre foot?

Q. Yes.

A. No, I doubt that. Per acre foot I assume they would probably be the same.

Q. Assuming that porosity and permeability are the same?

A. Yes.

772 Q. Don't you have a comparable condition of permeability from east to west in the East Texas field?

A. I think you have probably a higher permeability maybe in the middle of the field or the middle east part of the field than you do on the west or on the east.

Q. Is the permeability better at the north end of the field than in the south end generally?

A. You mean the extreme south and extreme north?

Q. Yes.

A. I don't think so. I think it is about the same.

Q. You think close to Joinerville and where your lease is on the north end are about the same?

A. No, my lease isn't in the extreme north end. I am talking about Upshur County. Comparing Upshur County with Joinerville I would say they are about the same.

Q. Are you north of the river?

A. Yes, it's north of the river. If you take leases right at the London area and opposite Kilgore in the fairway probably conditions are very comparable.

Q. Have you drilled any wells on the east margin of the field?

A. Yes, sir.

Q. What about the conditions of the field over there? Is it as good per acre foot as in the fairway?

A. No, it has a tendency to get shaly and finally goes into shale and pinches out.

Q. Per acre foot you would rather have your stuff where it is?

A. Yes, I bought it that way on purpose and paid the price for it.

Q. But it wouldn't be just an ideal yard stick to put on the field?

A. It wouldn't be a perfect yard stick and I  
773 don't think the Commission can get a perfect yard stick but I think you could have a yard stick which would do substantially more justice than the one you have now.

Q. What yardstick do you propose that the Commission follow?

A. I haven't suggested any. I think that the Railroad Commission, if they want to do equity, could find equity very easily.

Mr. Tilley:

They do it in other fields, don't they?

A. Yes.

Q. I think the Commission is anxious at all times to get the best information it possibly can about that.

A. I think they have information now, and they have refused heretofore—we made application three or four years ago that other factors should be considered besides potential alone, and the Commission has refused to consider any other factor but potential. I have the same feeling about taking the potentials on the west side of the field that the Examiner has. That to take wide open flow potentials is liable to cause coning of the water and trapping of oil which would never be recovered in the field and cause subsequent waste in that field.

Questions by Mr. Stanberry:

Q. This is more trying to arrive at the facts than a formal hearing. Do you believe that uniform withdrawals are good for a field?

A. What do you mean by uniform withdrawals?

Q. To withdraw from each area as nearly uniformly as you can so that the water level will rise uniformly, reducing the pressure uniformly and taking withdrawals uniformly.

A. I think that pressure should be maintained  
774 to the maximum and that the water level should be kept as nearly constant on a horizontal plane as possible.

Q. The only way you could do that is by uniform withdrawals, isn't it?

A. Not necessarily, no. In talking specifically about the East Texas field the middle of the field has a greater sand thickness than the east and west sides.

Q. The water level is the same?

A. Yes, sir. Consequently you can take out of the middle of the field greater amounts of oil than on the east and west sides, the reason being that you are draining a greater thickness of sand.

Q. If you take ten times as much out of 100 feet of sand as you do out of 10 feet of sand, would your water level remain constant?

A. I think it would.

Mr. Cottingham:

Let me ask this following that question. You said you thought it would; where the said thickness is 20 feet and you penetrated 15 feet sand and you are five feet above the water level and over here you have 50 feet of sand, and you penetrate 45 feet and are 5 feet above the bottom, if you take 2<sup>1</sup>/<sub>2</sub> times as much oil from it around the bore of that well that has 50 feet of sand than you do from this other well, are you apt to have water coning?

A. I don't think so. I think that the migration of oil is more horizontal than it is vertical.

775. — Mr. Cottingham:

Which direction does the water table pressure exert itself against the oil volume?

A. Vertically.

Mr. Cottingham:

That's all.

Q. Is your lease better than the adjacent leases to it?

A. No, sir.

Q. How far do you think that a well will drain in the East Texas field?

A. I think you could put a well in the middle of the Gladewater nose, where my lease is, without any wells within ten thousand acres and I think that you could produce that well to such an extent that drainage would be felt all over that ten thousand acres before water would come in.

Q. How big an area around your lease, and how far out would you have to go before you wouldn't find the

density just about the same as it is on your lease? What is the closest place to your lease where it is drilled denser than your lease?

A. Right north of us.

Q. How far?

A. I would say 1500 or 2000 feet.

Q. How far to the east of you?

A. That is northwest. To the northeast it would be 1500 or 2000 feet.

Q. And how far southwest?

A. I don't know. There are some small tracts down there around Lake Divernia.

Q. If you go due south how far would it be?

A. I don't know.

Q. How about to the east?

A. About half a mile.

776 Q. If you take a circle all the way around your lease a mile square around it would the density be more than your lease is or not?

A. It would be—there would be certain tracts where it would be greater.

Q. I am talking not about tracts but about the area as a whole.

A. I think it would probably be somewhere about the same.

Q. Then for a mile in each direction from you would the density be about the same as yours?

A. I think it would be. I am not capable of testifying accurately whether it would be or not.

Q. But it would be approximately?

A. Yes, sir.

Q. The allowable is about the same.

Mr. Tilley:

Are you testifying?

Q. No, I'm asking questions. Assuming that that is true and that for a mile around your lease the density is about the same and that the allowable is about the same, then are you suffering any material drainage?

A. I am.

Q. How?

A. We have, according to my idea of the ownership of our lease over there—we have a definite interest in the oil which we own in place, and in addition to that we have a definite interest in the reservoir pressure, and we have the right to utilize our percentage of it and it doesn't make any difference whether that energy is being utilized a half a mile away or not. If we are losing it, 777 then we are losing something we had originally.

Q. How much longer would your lease produce than the leases on the west side?

A. I don't know. That depends on what the Railroad Commission does and we couldn't forecast that.

Q. Which will produce the longest?

A. If we get equity, ours will produce substantially longer.

Q. Will your wells produce longer and in greater amounts than the wells over in the thin section on the East side?

A. Mr. Stanberry, if you give me my equitable proportion of the oil which I own now and let me utilize my portion of the reservoir energy, I will get my oil and the boys on the east will get theirs but I will get a lot more oil than they get and their leases will be producing longer than ours will but they won't be producing the amount of oil they are producing now.

Q. Will you not in the long run get more oil than they will anyway?

A. Than the boys on the east? You mean under your present system of proration?

Q. Yes.



A. No.

Q. In the long run?

A. No. You are talking about the boys on the east?

Q. Yes.

A. No.

Q. How about the ones on the west.

A. Yes. I bought more oil than they did. I could have  
778 bought leases near Gladewater or other places. I paid the price for mine to get in the middle of the fairway as I knew what the sand thickness was.

Q. You think that the Commission should attempt to adjust your allowable to where each man will get the oil which he had in place under his lease originally?

A. Originally?

Q. Yes.

A. Not now, no.

Q. You think that—

A. I think that is what they should have done in the beginning.

Q. Then say that a man—that this is a common reservoir and that you drilled your lease six years before Mr. Burke drilled his. In order for each man to get the oil originally under his lease how would you adjust the allowable where a man was delayed in beginning?

A. I didn't say I wouldn't adjust the allowable. If a man just sat down idly and let somebody else take the oil away, that is his hard luck.

Q. Maybe he didn't have as much money as you did.

A. That isn't my hard luck.

Q. There are difficulties in trying to adjust the allowable on any basis so that each man will get every pint or barrel of oil he had under his lease, aren't there?

A. Yes.

Q. It is a difficult proposition?

A. Yes.

Q. And if you take only the acre feet of sand  
 779 basis there is no way in which you can fix the  
 thing to where four acre feet of sand on the  
 west side will produce as much oil as four acre feet of  
 sand of the same kind on the east side.

A. Yes, sir, I think there is.

Q. How?

A. That is the reason I said that potential was a factor.  
 If you don't want to use potential, there are other  
 factors which could probably be substituted for it. I think  
 that the wells on the west side have a much higher  
 potential than the wells on the east side; consequently  
 their allowable would be higher and they would get a sub-  
 stantial amount of oil and wells producing from the east  
 side would be restricted to where they would get their  
 amount of oil but it would take them longer to get it out.

Mr. Tilley:

It doesn't make any difference whether you say you are  
 entitled to the oil and gas under your lease or are entitled  
 to the equal opportunity to produce your fair share of the  
 oil in that reservoir or whether, since you are going to  
 apply proration and restrict the production, that you are  
 entitled to be curtailed according to the relative rights  
 which you had before proration—under any of those propo-  
 sitions, if you apply any of them to this case you are  
 suffering confiscation?

A. That is right.

Mr. Tilley:

Mr. Stanberry has brought out that maybe within a mile  
 or two there weren't many leases drilled to a greater  
 density than your lease. But suppose just a mile away  
 there was a greater number of leases which were  
 780 drilled to a greater density than the ones a mile  
 from you. Wouldn't that necessarily mean that  
 those wells would draw from the area within a mile from

you and therefore the area a mile from you would draw from you. Therefore you would set up drainage circles throughout that field and eventually if you get a very densely drilled area anywhere in the East Texas field, it is going to take that group of operators and give that group of operators an advantage which if it keeps on going over will eventually reach you and therefore take your oil. Is that right?

A. That is correct.

(Mr. Stanberry):

Q. Mr. Rowan, what is the average density of the field?

A. I think that it is about 1 well to 5 acres?

Q. So we can just forget a mile around it and take for twenty miles around you and the average density would be the same as yours is.

A. Just about the same.

Q. If you are going to take the reservoir as a whole and you are drilled to the average density, then where are you being hurt?

A. I am being hurt by virtue of my position on the structure and the thickness of the sand and my greater reservoir. I bought more oil and paid for more oil and if you didn't—

Q. Won't you ultimately produce more oil any way?

A. No.

Q. You will produce longer than most of the leases.

A. Yes, I will produce longer than the leases on the west of mine.

Q. You will produce more than the leases on the east of you; won't you?

A. I think under the present system they will produce more oil than I will. There are a good many sub-marginal wells—

Q. Those sub-marginal wells on the east side which are now pumping—they are pumping now?

A. You mean less than 20 barrels.

Q. Yes.

A. I don't know.

Mr. Cottingham:

That is what I wanted to ask. Where are the sub-marginal wells in this field?

A. On the east side.

Mr. Stanberry:

So that ultimately you could get more oil by reason of your position on the structure than on the west or east?

A. Yes.

Mr. Cottingham:

Are there any sub-marginal wells on the west side?

Questions by Mr. Cottingham:

A. I don't think so.

Q. Are there any sub-marginal wells on the south side?

A. There are not.

Q. Wouldn't that be a flag to tell you where the first wells are going out of the picture? If you knew that?

A. That is the position which we have on the structure which we bought and paid for.

Q. If we knew the condition showing that some of the wells can't make their allowable on the west side and on the east side and we don't have any in the fairway that aren't making more than their marginal allowance, wouldn't that indicate that that shows that the fairway will produce much longer than the others?

A. The difference in the amount of production of any well as compared with the fairway is so small and if that condition continues to exist over a period of years, and I don't think anybody has any reason to believe that it will cease to exist unless the Railroad Commission does

something about it, then there will be substantial drainage from the fairway into the east portion of the field and there will be substantial drainage from the sparsely drilled areas to the densely drilled areas.

Q. Under the present rate?

A. Under the present plan of proration in East Texas.

Questions by Mr. Stanberry:

Q. If you are drilled to the average density of the field and as long as you are drilled to the average density of the field, then from the density standpoint you are not suffering?

A. From the density standpoint, no. I haven't complained about suffering from a density standpoint. I complain of the oil that is being confiscated and I am not being given an opportunity to produce the amount I am entitled to.

Q. If you aren't complaining as to the density of drilling—you say you are not complaining as to the density of drilling. You base your complaint on the sand thickness?

A. I base it on the method of allocating the allowable. I think Mr. Tilley stated that fully in the opening remarks.

Q. While Mr. Tilley stated it fully, we had quite a big of conversation about a .1 of an acre lease and how much it was getting and how little you were getting.

783 I am talking about averages. From the average of the field you are not suffering.

A. I am suffering. Certainly I'm suffering.

Q. On the average density?

A. Not on average density, but I am losing oil every day.

Q. From the standpoint of density. He may be getting more than he is entitled to.

A. There are a lot of wells getting more than they are entitled to and I am getting substantially less than I am entitled to.

Q. I won't argue that question with you. From the standpoint of acreage allocated to the wells I won't say he isn't getting more than he is entitled to—

A. If you want that question put in the record that I am drilled to the average density of the field, I will say yes.

Q. You aren't suffering from that feature?

A. I am not suffering from that feature but I'm still losing oil. I would like to say this, that if there was no proration and if I were left to my own judgment as to the drilling of those wells and we were on wide open flow the west side of the field would go to water quickly and the east side of the field would go to pumping and the middle of the field would be flowing, actually flowing, long after the east side had gone to pumping and was pumping small quantities of oil and the west side was plugged.

Q. It is doing that now, isn't it?

A. I would be losing the advantage I bought and purchased by buying in the fairway.

Q. It is doing that now, isn't it?

A. It is doing it to such an infinitesimal quantity; over a period of twenty years I will lose substantial quantities of my oil from under my lease.

#### Questions by Mr. Tilley:

Q. Mr. Rowan, according to your testimony density isn't the situation that is hurting you unless you apply the rule of proration which you are now applying; is that correct?

A. That is correct.

Q. Then it is hurting you?

A. That is correct.

Q. If you reduce the allowable of those wells to what they should be, then you wouldn't be hurt?

A. If they would adjust the allowables, that is correct.



Q. But if you let a man on one acre drill five wells and give him the same allowable that they give you when he has 1/20th as much oil as you have, then the density is hurting you, isn't it?

A. Yes, sir.

Q. Let me ask this question. If you had one well in the fairway on your lease and a man on the extreme east edge had one well on 20 acres on the east edge, wouldn't he eventually under proration produce substantially, a great deal substantially more oil, than you would? According to the amount of oil under the lease?

A. I didn't get the question.

Q. You are in the fairway and the Railroad Commission says you can't produce but twenty barrels a day on your 20 acres in the fairway but on the extreme east edge they said that another man with 20 acres could produce 20 barrels on his 20 acres on the eastern edge.

Eventually that will be the relation of the ultimate recovery of your well as compared to that lease in reference to the oil that underlaid it originally?

A. Mine would be substantially less. His would be substantially greater.

Q. That is the effect now under the present proration order, isn't it? It gives that marginal well on the east side that can produce only 20 barrels as much—it gives that well that can produce only 20 barrels a day, it gives them the same amount of oil within two barrels as you are given with an hourly potential of 964 barrels?

A. That is correct.

Mr. Cottingham:

Mr. Rowan, do you think that the marginal well statute should protect a well on 1 of an acre as much as a well on 5 acres?

A. I don't think so.



Mr. Cottingham:

You don't agree with the law, the marginal well statute?

A. No, sir, I don't. I think that we have certain property rights set up in our Constitution which should be inviolate. I don't think that just because a man has .1 of an acre, I don't think you should give that man an advantage to produce oil which doesn't belong to him. I don't think so.

Questions by Mr. Stanberry:

Q. You don't believe in redistribution of wealth then?

A. No. I think if I have a marginal farm and it will not produce enough wheat or corn or cotton to pay for the seed, then I think I would be a darn fool to  
786 plant it and I think that a man who doesn't have a substantial amount of oil is a darn fool to drill a well when he knows the ultimate production from it will not pay for it.

Q. If they took the restrictions off of you, wouldn't Mr. Wood take you to the same kind of cleaning, only worse?

A. No.

Q. Why?

A. Because I would drill so many wells around him I would burn him up.

Q. You would be just pulling in from every direction to your wells.

A. Yes, and I would burn him up and every operator around there would.

Mr. Tilley:

Mr. Wood wouldn't be there, would he?

A. No.

Q. He would get more oil than he had under his .1 of an acre whatever you do.

A. Yes, but he wouldn't have the advantage he has now.

Q. He could get more in a day that he has under it.

A. He might or he might not.

Q. What is the potential of his well?

A. If Mr. Wood waited six years under open flow conditions to drill a well on the .1 of an acre, he wouldn't find it profitable to drill that well and pump it.

Q. But talking about conditions as we find them now, if you could take the restrictions off, couldn't he in a day run more oil than he ever had under his lease?

A. He could if we sat by and didn't drill, but if we drilled 1 well to .1 of an acre, there would be  
787 twenty rigs around him and all twenty would be pulling the same as he would.

Q. But they would be pulling more from outlying area into that area.

A. I assume, Mr. Stanberry, that drainage is in a circle that your drainage area will be like this and that the operators, the other operators, would make the same effort to protect their land from drainage which I would and his well being in the center—

Q. If you had a well drilled every 50 feet from him to the north, east, south, west, northeast, northwest, southeast, and so on, if you had eight wells drilled around him within 40 or 50 feet of each other don't you think any oil would pass those wells and go to that well when you create that low pressure area?

A. No, sir.

Q. You don't think so?

A. No, I don't. I have operated in a good many fields under open flow conditions and I have never seen that condition exist.

Q. You are the first man I ever saw that thought that oil drained each way so far and then turned around and went back.

A. I suppose that the other operators are like I am and would protect their interests.

Q. If you created a low pressure area and have five wells around there you don't think that any oil will pass those four on the outside and get to his?

A. I think that the drainage is just as likely to be in this direction and this direction as it is to be over here and I think that your drainage is likely to be this way. Assuming that—

Q. It is just as likely to be this way?

788 A. The circle would be like that.

Q. It would drain past those wells, wouldn't it? Don't you think wells will drain past each other?

A. It depends on how you produce them? If you shut one in, it would.

Q. If you produce them wide open or under restricted flow or any way.

A. No, I don't think so.

Questions by Mr. Cottingham:

Q. Have you any information as to whether the vertical permeability and the horizontal permeability of the Woodbine section is the same or different?

A. I would be inclined to think offhand that the horizontal permeability would probably be greater.

Q. Have you any data on the comparison of the permeability along the longitudinal section? Is it greater along the fairway than on the east and west sides on the horizontal plane?

A. I believe it is greater—you are talking about the field?

Q. I am talking about field drainage, over-all drainage.

A. I believe it is probably greater in the fairway.

Q. That is all.

Mr. Stanberry:

It is after twelve. We will recess until 1:30.

789

Mr. Stanberry:

Proceed with your witness.

Questions by Mr. Tilley:

Q. Mr. Rowan, of course you said you bought this acreage over there and bought it on an oil content basis on its position on the structure.

A. Yes.

Q. You have paid taxes on it, haven't you?

A. Yes.

Q. The State of Texas taxes your oil on the oil content and the oil in place and gas in place; isn't that right?

A. Yes.

Q. And they also tax the east and west sides the same way?

A. Yes, sir.

Q. On the ownership of the oil and gas in place. Yet you are a producer and the State turns around and lets you produce on practically a per well basis?

A. Yes.

Q. One well on 10 acres gets as much as 1 well on 1 acre.

A. Yes, sir.

Q. With a small variation in the potential?

A. Yes, sir.

Q. Mr. Cottingham has asked you certain questions the effect of which would indicate that the sand conditions over there aren't uniform. I will ask you whether or not they are fairly uniform?

A. In my opinion they are fairly uniform.

Q. Is that generally conceded by most of the engineers?

A. I think so.

Q. Evidence was introduced almost uncontroverted in the Federal Court in Houston as to that?

A. Yes.

790

Q. And the Railroad Commission was a party to that?

A. Yes.

Q. And the Railroad Commission didn't take issue with it?

A. I don't think so.

Q. Of course, Mr. Rowan, we know that no man can conceive of a perfect proration anywhere but if a plan of proration was conceived in East Texas which gave effect to potential and acre sand feet, could adjustments be made if there were any variations in the formation of variations in the sand thickness in any particular area?

A. Yes, sir, I think that adjustments could be made.

Q. If the Railroad Commission were able to determine—

Mr. Stanberry:

From the engineering standpoint or the legal standpoint?

A. From a practical standpoint.

Mr. Stanberry:

You don't know whether it would be legal or not?

A. I think it would be legal. I think the Railroad Commission could make the same adjustments to take care of any inequities that might take place in any given order under a plan of proration which considered the acre feet of sand thickness and potential or any other factors the same as they do now, under the potential method of allocating the allowable production of wells. Each operator could make complaint and adjustments could be made.

Q. Don't you think that engineers, the Railroad Commission's engineers who are very competent—  
791 don't you think that they could with more definiteness determine the sand thickness throughout the field than they have been able to tell the potential of the various areas?

A. Yes, sir, I think they could. I think that there is more information available as to the sand thickness and content of the sand and porosity and permeability of the

sand than there is as to the potential ability of each and every well in the field to produce.

Q. The present plan is based on potential, isn't it?

A. It is based on average potential only. They use something like 300 wells and draw theoretical contours which indicate the ability of the probably 24,000 or 24,500 wells to produce.

Q. And then make adjustments in cases where the potential—would the variations in the sand there under be demonstrated by the potential?

A. Not altogether.

Q. To a large extent would it? To some extent isn't it?

A. You mean the condition of the sand?

Q. I mean if there were variations. If one well was drilled into shale or there was a shale formation in the sand area around that particular well, wouldn't that be reflected in any way by the potential of that well?

A. To a very limited extent I would say that the thickness of the sand is indicated by the potential of the well.

Mr. Stanberry:

The potential of the sand and the depth to which they drilled into it would affect it.

A. Yes.

792 Mr. Stanberry:

But the potential alone wouldn't reflect the sand thickness?

A. No, sir.

Q. You have seen these sand contour maps of the Railroad Commission by their engineers, haven't you, which have been used by the Railroad Commission?

A. Yes.

Q. Do those maps show the sand conditions fairly uniform?

A. They indicate the thickness of the sand.

Q. Do they show it is uniform and remains constant? Of course there is a variation on the east and west but do those maps show it fairly uniform in such a way that an engineer—

A. What do you mean by uniform? That it has the same thickness all over the area?

Q. Only as to depth and thickness.

A. They indicate definitely that the saturated portion of the sand goes from nothing on the west to its greatest depth in the middle of the field and tapers off to nothing on the east.

Q. If they use that as a factor in determining the oil reserve and there is a variation of any kind that could be determined, couldn't it?

A. It could be determined very easily. I think you could draw a cross section of the field and put the field in squares of 640 acres which would be less than 200 squares and I think that if necessary to get information the operators in the field would drill test wells which would penetrate clear through the sand even though the test wells had to be plugged later on. Those test wells could be cored and indicate exactly the sand content and Schlumberger surveys could be made which would give a further check against the core record and a very definite knowledge of the thickness of the sand and the saturation and the porosity could be determined. It could be determined to a fairly accurate extent right now from the information they have from the wells now.

Questions by Mr. Cottingham:

Q. Are you speaking from any tests you have made yourself or just speaking from the general information which you have acquired from the practical standpoint?

A. I am speaking from tests I have made and from general information which I have acquired.



Q. Do you know of any wells where the offset well contains half the amount of actual saturation with reference to an offset well? Have you cored any cases like that?

A. That might be true on the east side of the field but I don't know of any from my own knowledge. I think that the information that you have now which you make the sand contour maps on would be definitely more accurate than the information which you are using right now on potentials. I think the conclusions which you are drawing from potentials right now are very very inaccurate.

Mr. Stanberry:

Your idea is to make sand contours the basis—

Q. What the geologists and engineers call the isopach method of getting the thickness of the sand?

A. Yes.

Q. In the early history of the field the water level was practically level and everybody agreed it  
794 was practically minus 3320?

A. I think that is correct.

Q. Has the water table maintained that level condition during the field since 1,200,000,000 barrels of oil has flowed from the field?

A. I am of the opinion it has risen some.

Q. Where has it risen the most?

A. I don't know.

Questions by Mr. Tilley:

Q. Mr. Rowan, we were talking this morning about uniform withdrawals. I will ask whether or not the withdrawals that have been allowed by the Commission have not been different, that is, with the weighted potentials used one well has been given a substantially higher allowable than another well. Would that keep the water

level just about the same or would that cause water coning? What was the effect of the Railroad Commission having given one well a better allowable than another?

A. I don't understand the question.

Q. It was intimated this morning that if the Commission went ahead and adjusted the allowable for these wells and you had a high—withdrawal from one lease than from another lease or a higher withdrawal from one part of the field than from another part that the water level wouldn't rise evenly and unequal withdrawals might cause premature water encroachment or one thing or another—

A. I don't think that was intimated or I didn't hear it. I didn't understand it.

Q. You do know when this order was first promulgated taking into consideration potentials that one well  
795 in the field was allowed substantially more than another well in the field, don't you?

A. Well, I wouldn't want to say substantially but it was allowed to take more.

Q. The difference between the worse marginal well in the field and the best well in the field was enough that that same margin if given you now would substantially relieve you, wouldn't it?

A. Yes, sir.

Q. The Railroad Commission has tolerated that condition for some time?

A. Yes, sir.

Q. Has the Railroad Commission in other fields been able to determine factors the result of which when applied to the proration order would give equity to the operator who has more acreage than another operator?

A. I think that acreage has been a factor in a good many fields.

Q. Do you know of any reason why those fields—the underground conditions in those fields is such that the same order could not be made applicable in this field?

A. No, sir, I don't know of any reason why.

Mr. Cottingham:

Have you any specific fields in mind which you could compare with East Texas?

A. No, I don't have any specific fields.

Mr. Cottingham:

Do you have any field that has the condition of permeability that East Texas has?

A. No. I think East Texas is a separate and distinct field.

Mr. Cottingham:

When you talk about East Texas, then the door is closed.

796 When you compare East Texas with any other field, the door is practically closed. Isn't that your opinion?

A. I think that—

Q. What about Van?

A. Van is probably in a measure a comparable field although Van is a different type structure from East Texas. I don't know what the proration schedule is in Van or what they base it on. I don't have any knowledge of it at all. I know it is a different type of structure from East Texas.

Q. Now, Mr. Rowan, the fact that you would ultimately produce the amount of oil that you claim you are entitled to wouldn't relieve your situation now because it would limit and deprive you of the right to produce that oil now as you have a right to do, isn't that right?

A. I assume from your statement, Mr. Tilley, that you are asking me if the present method of proration was continued into effect and assuming that the time would take care of me and I would get my ultimate amount of oil under the present schedule?

Q. Yes.

A. I don't think I would get it.

Q. I say if you did, you claim that the time element would still be confiscation?

A. That is right.

Q. You have a right to your equal opportunity to produce now?

A. Yes, I think I should have. I think I am entitled to it now and think I have been deprived of it for five or six years.

Q. At the present time you will lose your energy and also your right to produce now your fair share of the oil?

A. Yes, sir.

797 Q. The Railroad Commission of course has logs of all the wells in the East Texas field; doesn't it?

A. Yes, sir. I think that the rules and regulations require that you have to file a sworn log.

Q. Do those logs show the penetration of the well in the saturated sand?

A. They are supposed to. That is the way contour maps are drawn—

Mr. Cottingham:

You say they are supposed to?

A. Yes.

Mr. Cottingham:

What do you mean by supposed to? Don't they reflect the actual sand conditions?

A. They are supposed to.

Mr. Stanberry:

Some of them might and some of them might not?

A. I think they are subject to error on the part of the man who is making the log, the driller.

Mr. Stanberry:

And whether he swore to the truth or not?

A. Yes.

Questions by Mr. Cottingham:

Q. How do you make the logs? Most of them are drilled with rotaries?

A. Yes.

Q. After you encounter the top of the Woodbine—

A. The log is either made from the core record or from the driller's knowledge of how the sand or formation drills and the way he logs it, whether he logs it sand or shale.

Q. Can the driller determine from how it is drilling whether he is drilling in sand or shale?

798 A. Yes, if he is a good driller.

Q. I am wondering how many good drillers they have.

A. They did have a bunch of good ones. I don't know how many there are now.

Q. This is the point. It is a serious point because when you take a driller's log of a rotary well and try to compare it with core tests—did you ever try to do that?

A. Yes.

Q. Did they compare favorably?

A. I have not only compared them with core tests but I have also compared them with Schlumberger tests and I know of driller's logs that are 98% accurate. I have in mind a well I drilled for Stanolind which compares with the core record and the Schlumberger record and was practically a perfect log made by the driller. That was in the Gulf Coast field. That was one comparison which I have made. I have compared driller's logs on a number of occasions with Schlumberger records.

Q. Can you tell what portion is saturated?

A. Not except by coring or Schlumberger.

Q. Can a Schlumberger tell?

A. Not 100% accurate.

Q. About what per cent would you say the Schlumberger could tell you even in non-producing horizons?

A. In non-producing horizons I think the Schlumberger is pretty accurate. It will make some errors. I think a Schlumberger can tell you accurately the sand and distinguish it from the shale or non-porous matter.

Q. How many Schlumbergers out of the 25,000  
799 wells in the East Texas field have been made?  
How many wells have had Schlumbergers?

A. Not a whole lot.

Q. Would you say 10% or 5%?

A. I doubt if it is 5% but I imagine there are more Schlumberger logs in the East Texas field than there are key wells which you are using for potential tests. For that reason I think your percentage of accuracy in making a sand map would be greater than the percentage of accuracy in the potential map.

Q. What does the potential of wells—does that reflect permeability?

A. I think so.

Q. Porosity?

A. To a very limited extent.

Q. Sand thickness?

A. Yes, to a limited extent.

Q. What else? Does it reflect pressure?

A. Yes.

Q. In other words the potential reflects all the factors which go into the ability of that well to produce over a certain period of time?

A. Yes, sir.

Q. But it doesn't tell you how much oil is in place?

A. No, sir, it doesn't.

Q. The driller's log gives a better index to the condition of that well to produce than the actual potential?

A. The core record would give a better picture of the oil content of the reservoir than the potential.

800 Q. All right. Let's see if it will. Did you ever see any cores of the deep Ordovician horizon in Big Lake which produces four to five thousand barrels a day?



A. No, I never did.

Q. Did they show anything—

A. I don't know, I'm not familiar with them.

Q. Have you seen logs that didn't show anything from a core standpoint which produced large quantities of oil?

A. You mean the cores didn't show any oil?

Q. Yes.

A. And didn't show any porosity?

Q. It showed poor conditions of porosity and permeability.

A. And no saturation, and yet it produced?

Q. Yes.

A. No, I have never seen that in my life.

Q. I have.

Mr. Stanberry:

Have you drilled any wells in the Ranger field?

A. No.

Mr. Stanberry:

Do you know anything about that area?

A. Very little.

Mr. Stanberry:

Have you ever heard that a great many of those wells up there when drilled in with cable tools showed a rainbow and then made five or six thousand barrels?

A. No. I don't know that I would say I have heard of it from a rainbow to five or six thousand barrels but I have seen instances where you had a small well before it was shot and a large well after it was shot.

801 Questions by Mr. Tilley:

Q. Mr. Rowan, you have estimated or calculated that the total acre sand thickness in the East Texas field is 5,300,000?

A. Yes.



Q. And that your Todd B lease is 2499?

A. Yes.

Q. And the number of wells you used was 24,710?

A. Yes, sir.

Q. As to the field and five as to your lease?

A. Yes, sir.

Q. The approximate number of wells now is 25,000 which only makes the condition a little worse?

A. Yes.

Q. The average density in the field is 5.12?

A. Yes, sir.

Q. And your actual density is 5.00?

A. Yes.

Q. The average potential in the field—

A. I am a little lower than the average.

Q. You took the average potential which is 605 for the field as against your potential for your lease of 964?

A. Yes, sir.

Q. Then you have taken an allowable of 499,986.7?

A. Yes.

Q. The present allowable per acre is 3.955?

A. Yes, sir.

Q. And for your lease it is 4.480?

A. That is correct.

802 Q. You have attended the recent Commission hearings, haven't you, in which Mr. Cottingham has testified with reference to the pressure drop in the East Texas field?

A. Yes, sir.

Q. From your study and from his testimony and from the evidence you have been able to gather, it is your opinion that there is a continual pressure drop in the East Texas field under the present rate of withdrawal?

A. Yes, sir.

Q. That means as more wells are granted by the Railroad Commission that either one of two things must

happen; that the allowable of the wells in the field must be cut or the allowable for the field must increase.

A. Yes, that is correct.

Q. If the allowable for the field increases, under Mr. Cottingham's testimony and everybody else's opinion, that will create unnecessary waste?

A. Yes, sir.

Q. Then the only alternative to give you the protection you are entitled to isn't by the drilling of additional wells by anybody in the field but it is by adjustment in the allowable.

A. That is correct.

Q. Is the East Texas field drilled to such an extent now that there is probably 1 well on every 10 acres in the field?

A. I think it is, Mr. Tilley.

Q. That is all.

803 Questions by Mr. Stanberry:

Q. Mr. Rowan, I believe you have just testified that if the allowable was increased it would create unnecessary waste. Was that your testimony?

A. Yes, sir. The allowable for the field.

Q. If you take this thing on the basis of the marginal well law, then is there any such thing as adjusting these allowables on the basis which you ask for without raising the total field allowable and thereby creating the waste which you say will occur if we cannot cut the marginal wells below 20 barrels?

A. No, sir.

Q. Then when we adjust it according to your plan which you lay out, have you figured how much that would increase the field allowable?

A. Not considering the marginal well law, I have not. It would materially increase it though.

Q. That would bring about unnecessary waste?

A. In my opinion it would.

Q. You want us to adopt a method of allocation and proration which would bring about unnecessary waste?

A. No, I don't.

Q. If we can't adjust it the way you request without increasing the allowable and then increasing the allowable will create unnecessary waste, then won't it necessarily follow you are asking us to adopt a method of proration which would create unnecessary waste?

A. Mr. Stanberry, in 1933 I filed suit in the Federal Court in Fort Worth against the Railroad Commission because I complained of the fact that they shut  
804 down my property in East Texas, and your Commissioner Mr. Thompson came to Fort Worth and sat in my office and discussed that lawsuit with me. He said at that time—he asked what I was wanting and what I was contending for in the way of equity and I told him. I asked him in that conversation "What are you going to do when you get 25,000 wells in East Texas and the marginal well law catches up with you? Would you put the field back on a per well basis because all the testimony of the engineers has been that between four and five hundred thousand barrels is the maximum that field can produce without physical waste." He said "We don't have to abide by the marginal well law in prorating flowing wells in East Texas" and I assumed he knew what he was talking about and was telling me the truth and that you don't have to abide by the marginal well law.

Q: Did you ever know any lawyer that knew exactly what the law was?

A. No. But I was talking to the law in Texas so far as oil and gas is concerned and that was the Chairman of your Commission.

Q. The Court would decide that. Did you ever know any lawyer that always knew the law except the man writing the decisions?

A. No, he is the only one supposed to know the law. I don't have any knowledge right now of any Court in the United States or the State of Texas which has said that the marginal well law is constitutional.

Q. Nobody has doubted it enough to attack it.

Questions by Mr. Tilley:

Q. We are right now if it does mean that. Mr. Rowan, if the Supreme Court had any general idea what it was talking about in Brown vs. Humble and if the  
805 Federal Court had any general idea what they were talking about in the ..... case, then one of two things must happen that in order to give an operator in the East Texas field the right to produce his fair share of the oil, he must be given an adjustment of allowable or must be given additional wells. That is the only way he could get his fair share of the oil. Now if the law is that the Railroad Commission cannot be forced to make an adjustment in the allowable, then there is only one remedy left for the operator now being discriminated against and that is to drill additional wells. Then I will ask you a question on that premise of law that if additional wells must be drilled there must be a substantial number of wells drilled you say in order to give the adjacent lease owners and others similarly situated more oil. That means there will have to be drilled such a number of wells that if each well is given 70 barrels a day, the allowable of 500,000 barrels a day must be exceeded, then if that is done and those additional permits are granted, that means that waste will be created, doesn't it, if the allowable exceeds 500,000 barrels a day so that one of two things must follow: The marginal well law must fall or be so construed as to not do that or the Constitution must be done violence to because it says that the Legislature shall pass laws to conserve the natural resources of this State; is that right?

A. I think you would have physical waste, yes, sir.

Q. The fact question which I wanted to ask you was this; aren't there enough leases probably in the East Texas field that are drilled like your lease that in order to be put

on a parity with the other operators in the field  
806 and have an adjustment in allowable they would

have to drill such a number of wells to get their fair share of the oil that the marginal well allowance of 20 barrels a day would put them above the 500,000 barrels a day and then you would be on a per well basis?

A. You would be on a per well basis and I think that the field allowable would keep steadily climbing to a point where you would have physical waste in the field.

Mr. Stanberry:

If the Commission shouldn't comply with your request and adjust your allowable on an acre foot of sand basis, you think they should take into consideration in granting permits or drilling wells the sand thickness?

A. I don't see how they could do that. It might be possible for them to do that. I don't see how they could do that. I think that probably in the fairway with the thick sand section, in that portion of the field it would probably be drilled up to a greater density than the rest of the field but I don't think that is a factor that has been considered heretofore in granting permits.

Mr. Robertson:

It has been argued in some hearings which I have attended. Mr. J. S. Hudnall testified to that effect.

Mr. Tilley:

That is all.

Questions by Mr. Rauhut:

Q. Sun Oil Company owns a lease on the Allen Tooke 50 acre tract. Its lease has a similar sand to your lease, according to your information, doesn't it?

A. As far as I know, it has.

807 Q. They have about 10 wells on that 50 acre tract, don't they?

A. I don't know for sure but imagine that is correct.

Q. The allowable for those wells is about the same as your well?

A. Yes, sir, that is correct.

Q. As between your lease and the Sun lease each of them occupies about the same position and one doesn't have any particular advantage over the other or any particular disadvantage?

A. No, I don't think so.

Q. Are there any wells on the west side of the field—you say generally the wells on the west side have a higher potential than the wells on the east side?

A. I think so.

Q. Even though they may have the same sand thickness on the extreme west edge and the extreme east edge?

A. Yes, sir.

Q. The difference in potentials between those wells on the extreme west edge and the extreme east edge doesn't indicate what additional quantities of oil are in place under the wells on the east edge?

A. It doesn't indicate any additional what?

Q. It doesn't indicate that wells on the west edge have any more oil in place?

A. No, sir, it doesn't. It indicates they have more reservoir energy to utilize to get the oil.

Q. It is closer to the source of the pressure.

A. That is right.

Q. And perhaps a more permeable and porous sand?

A. Yes, sir, it is.

808 Q. The potential factor doesn't necessarily indicate the quantity of oil in place?

A. No, sir, it doesn't at all.

Q. You say wells on the east side producing from four feet of sand for instances—I believe that is the thickness

you used in your testimony—would have a longer producing life than wells producing from four feet of saturated sand on the west side.

A. I believe they will.

Q. Is that because there is more oil in place in the four feet of sand on the east side than under the four feet on the west side?

A. No, sir. There would be the same amount.

Q. Why is that?

A. Because of peculiar conditions in the structure. I think some drainage would take place from west to east.

Q. The wells on the east edge will produce from the same sand thickness as compared to wells producing on the west edge but will have a longer life through drainage from the area to the west to those leases on the east edge.

A. That is correct.

Q. With reference to the basis of taxation I want to ask about that. Do they tax you over there on the basis of the estimated sand thickness?

A. No.

Q. Is each acre taxed equally whether it is on the east edge, west edge, or middle of the field?

A. Mr. Rauhut, I haven't attended one of those equalization board hearings in several years but the ones I attended they gave a greater valuation to the  
809 leases in the middle of the field than they did to the leases on the east or west. They took into consideration or tried to take into consideration the fact that the leases in the middle of the field were more valuable by having a greater sand thickness and a greater amount of oil in place.

Q. I understood from your testimony that you are still of the view that there should be a top allowable for the field.

A. That is correct.

Q. And that the top allowable which now exists is in the neighborhood of being correct?



A. It is probably a little high.

Q. And that there should be some proration order?

A. Yes, sir, I think you need proration.

Q. Also I understand that there should be some restriction on the number of wells to be drilled in the field and the spacing of wells or distribution of wells?

A. Yes, sir.

Q. You have no quarrel with Rule 37 as to spacing?

A. I have a quarrel with the administration of it in East Texas. I don't think they should let a man drill 15 wells on 3 acres.

Q. I understand but leaving out of consideration any matters of administration you think there should be a spacing rule and it should be enforced?

A. Yes, I do.

Mr. Cottingham:

Do you know how many wells that the Commission has denied permits on, the Courts have permitted to be drilled under injunctions?

A. No.

810 Mr. Cottingham:

In the early history of the field?

A. No, sir.

Q. I think you could say that during Mr. McCraw's administration there have been none.

Mr. Robertson:

I don't know of but one in the last two or three years. There was an injunction granted about two or three months ago.

Mr. Rauhut:

The decisions came out about that time.

A. I think that the Courts have been equally prone to uphold any exception to Rule 37 that you might grant. I don't know of any well that has ever been plugged where the operator went to Court and tried to set aside the order of the Commission.

Mr. Burke:

Wasn't the Whittington well plugged on the church property there in the middle of the field?

A. Probably. I don't have any knowledge of it.

Mr. Granberry:

During the early days of the field there were numerous Court injunctions granting wells.

Questions by Mr. Tilley:

Q. Mr. Rauhut asked you this question and I want to be sure you understood the question. You say that you have no quarrel with Rule 37. You mean Rule 37 as a spacing regulation and not with a provision in it that exceptions can be granted to prevent confiscation of property where the granting of that well under that exception would give that fellow a greater advantage over the adjacent lease owners than the adjacent lease owners had over him before the permit was granted?

A. I said the basic Rule 37 I had no quarrel with but I do have a quarrel with the idea that they give  
811 a man an exception to Rule 37 in order to protect vested rights and then give that man license to take something he doesn't own and give him the right to do the very thing I complain of if they don't give me the right to drill.

Q. This is your argument, that they gave Mr. Wood a permit to protect vested rights on his .1 of an acre?

A. That is right.

Q. And in order to prevent confiscation they gave him this permit and then he confiscates more of your oil than you were confiscating of his?

A. They gave him the license to do it, yes, sir.

Q. So if you just continue that, you will keep on drilling and pretty soon you will have 75,000 wells over there.

A. I guess that is a fact.

Questions by Mr. Cottingham:

Q. Do you believe that the more wells you drill the more oil you get?

A. Not under proration I don't.

Q. Do you under open flow? Will it allow more oil to be recovered if you drill more wells?

A. I believe it would.

Q. What is the difference?

A. The difference is you utilize the reservoir energy under proration and under open flow you wouldn't.

Q. What forces do you have which would force oil in the hole?

A. In East Texas?

Q. In any field.

A. It depends on the field. Some fields have a  
812 water drive and expansion of gas.

Q. Don't you have water drive and expansion of gas under open flow?

A. You do but you don't utilize it efficiently. You utilize it inefficiently and it acts as a detriment instead of a conservation measure. Your water comes into the well head under open flow and comes in unevenly instead of coming in on an even keel.

Mr. Tilley:

Mr. Cottingham, you have testified at a number of these proration hearings?

Mr. Cottingham:

Yes.

Mr. Tilley:

The public is permitted to interrogate you?

Mr. Cottingham:

Not when I am holding a hearing.

Mr. Tilley:

You won't give us a right to interrogate you at this time?

Mr. Cottingham:

I am not a witness.

Mr. Tilley:

I am calling you as a witness now.

Mr. Cottingham:

When I am one of the Examiners, I don't think that will be correct.

Mr. Tilley:

Will you let me put your assistant engineer on the stand?

Mr. Cottingham:

This is your case and you have your witness.

Mr. Tilley:

I am asking you to put the Railroad Commission's Chief Engineer on the stand and if refused that right I want to put his first assistant on.

813

Mr. Cottingham:

We aren't furnishing the evidence in this hearing.

Mr. Tilley:

I am not going to ask him for expert testimony but for information which you have by virtue of your public services.

Mr. Stanberry:

Before you take another witness, I have a few questions I want to ask. Mr. Rauhut, you represent the Sun Oil Company?

Mr. Rauhut:

Yes.

Mr. Stanberry:

You represent none of your other clients in this particular hearing?

Mr. Rauhut:

No.

Mr. Stanberry:

You represent the Shell and Magnolia?

Mr. Robertson:

Yes. I came up to protest the application for the wells. At the first hearing held I made a statement that neither the Shell nor the Magnolia took any position at all with reference to the request for an adjustment of the allowable and that still is my position. I am here to protest the granting of these twenty or twenty-five permits. As far as the other part is concerned, I am taking no position at all.

Mr. Stanberry:

I wanted to ask you what your position was on the alternative proposition.

Mr. Rauhut:

My position is that we protest vigorously the granting of each additional well sought as an exception to Rule 37 because we think that the record shows that there is no ground for an exception. So far as the application for an adjustment of allowable is concerned, the Sun Oil Company itself at a prior hearing told the Commission  
814 several years ago itself sought an adjustment in allowable or at least Mr. Heath testified on the matter at a Commission hearing. I think that the Company explained itself at that time as being in favor of an adjustment of allowable and thought that it was something which should be done about it. I am not here to state their view on the adjustment of the allowable at this time and I am not having anything to say about it. I don't want to say anything that would be inconsistent with anything they have done in the past on the matter and if there is any adjustment of the allowable on any lease we don't expect by our silence to be prejudiced in our right to have a similar adjustment. We expect an adjustment on our lease if there are some handed out.

Mr. Stanberry:

I wanted to know what your position and Mr. Robertson's position and the other people who have entered appearances would be on the alternative proposition.

Mr. Rauhut:

I am not here to encourage or protest the application for an adjustment of the allowable but we give notice that we are not conceding that one fellow should get an adjustment without us getting it.

Mr. Robertson:

Our position will be the same as that.

Mr. Cottingham:

Back to the hearing which you spoke of when the Sun Company furnished the technical witness on adjusting the allowable, at that time the allowable was around 29 barrels per well, wasn't it?

Mr. Rauhut:

I couldn't tell you exactly. It was my recollection off-hand that the allowable was much higher per well at that time. That was back in about 1935, though; I guess.

Mr. Cottingham:

Assuming that it is as you remember the testimony—I think it was 29—but whatever it was assuming that it was 29—

Mr. Rauhut:

I believe you are more correct than I am.

Mr. Cottingham:

The testimony at that time was to the effect that if every 10 acres was to get 29 barrels a well on 1 acre would get 2.9 barrels. Was that your recollection also?

Mr. Rauhut:

I didn't attend that hearing. I have heard something about it in a general way and know they developed what a small amount a small tract would get. I know from general information that there was a discussion of that.

Mr. Cottingham:

If that was the testimony that 1 well on a 1 acre tract would get 2.9 barrels, then the Wood well under that testimony would get .29 of a barrel per day, wouldn't it?



Mr. Rauhut:

If that is .1 on an acre, yes.

Mr. Cottingham:

Your position is the same—the Sun Company's position is the same today as it was then?

Mr. Rauhut:

I am stating that I am not here to assert any position with reference to the adjustment of the allowable either to urge it or to protest it. That I am remaining silent on that point but don't want my silence to be construed that we are willing for the allowable to be adjusted on the Rowan & Nichols lease and not be adjusted on ours.

Mr. Cottingham:

Were you present at that prior hearing?

816 Mr. Robertson:

Yes, I was present part of the time but I don't know all that took place. My attitude is like that of Mr. Rauhut. I attended the original hearing on Mr. Tilley's application for these twenty wells and stated that I was taking no position whatever with reference to the adjustment of allowable but was only protesting the granting of any permits for any of these wells and that is still our position, and it is the only position we have taken in this hearing or that hearing. We neither say—if anybody else's allowable is adjusted, we might then take a position but I don't take any now.

Mr. Cottingham:

You aren't taking any now and neither of you advocate any adjustment, any re-adjustment of the present scheme or plan in East Texas.

Mr. Rauhut:

No.

Mr. Robertson:

We are taking no position one way or the other on the question of the adjustment of the allowable.

Mr. Rauhut:

I haven't been employed to appear on anything but the Rule 37 feature of the case.

Mr. Stanberry:

Mr. Rowan, you say that the reason that these wells with four feet of sand on the east side will produce longer than wells with four feet of sand on the west side is because the pressure is driving the oil east?

A. You are talking about under the present plan of proration?

Questions by Mr. Stanberry:

Q. Yes.

A. Yes, sir.

Q. If that is true as to the shallow sand, then isn't it also true that under this restricted rate of flow  
817 water is washing the oil out of the thin sands on the east side and flowing it toward your lease?

A. No.

Q. Why will it drive one way or part of the way from west to east and not the balance of the way?

A. Because we have—with 2 feet of sand on the west they are producing 22 barrels a day where they only have 2 feet of sand to drain from and we have 50 times that much, and you are giving us practically the same allowable as those people on the west. How can we get any oil from them?

Q. The pressures are higher on the west than on the east, aren't they?

A. Yes.

Q. Doesn't the pressure gradient come down from the west to east?

A. Yes.

Q. If the higher pressure is in the fairway will drive it to the low pressure on the east, then why will not the high pressure in the water area drive it toward the fairway?

A. How can you drive it when you aren't letting us take it out?

Q. You are taking some of it.

A. We are taking a little. If we took more than our pro rata part of the oil under the fairway there would be a migration of oil.

Q. Which of the pressures are higher, on your lease or on the west side where water comes in?

A. They are higher on the west.

Q. If the higher pressures—if the pressure is higher on the west, where is there no drainage of oil toward the low pressure area?

A. - You can't drive oil unless you pull out the  
818 stop cock and take it out.

Q. You have already opened it up because the pressure is lower. If the pressure is lower—if the higher pressure in the fairway will drive it toward the low pressure on the east side, why won't the high pressure on the west side drive it toward the fairway?

A. I am talking about ultimately.

Q. I am talking about now. I thought you were talking about now.

A. I am talking about the ultimate recovery. When the water reaches my leases then my leases will be the high pressure leases, the highest pressure leases in the field; isn't that right? They should be any way.

Q. The thing is this that if you have your lowest pressure on the east side and your highest pressure is on the west side and your oil is migrating from the fairway to the east side because of the high pressure, then why isn't it migrating from the west side into the fairway because of the differential in the pressure.

A. That is the very thing I have argued; that you should have a gradient. And by virtue of the high pressure you should give them a higher allowable.

Q. You think that the west side wells with the highest pressures should have a higher allowable than your wells?

A. I don't think so, no. I think you should take into consideration that pressure and should also take into consideration the sand thickness too.

Q. How much consideration of pressure—you  
819 take an east side well with four feet of saturated sand and a west side well with four feet of saturated sand. How much more allowable do you think the west wells should have than the east wells?

A. I don't know. You have engineers to figure that out. Certainly it should have more.

Q. Whenever you try to figure that and the sand thickness you would have a job figuring it, wouldn't you?

A. I don't think so. I think you could make an order which would be ten times more equitable than the one you have.

Q. Part acreage, part pressure, and part sand thickness, a combination allowable?

A. Yes.

Mr. Cottingham:

Under your suggestions would the Commission have to do away with the marginal well statute?

A. I think they would to do equity between leases.

Q. Could you outline a plan of proration which you would recommend based on those three factors and submit it to us?

A. I could give you my ideas about it.

Q. We will appreciate it. That is all.

Mr. Tilley:

Mr. Cottingham, I don't want to embarrass you but I will again ask you—

Mr. Cottingham:

I am not a witness in this case.

Mr. Tilley:

I know that you are not but notwithstanding that you are still the Chief Petroleum Engineer or whatever your official capacity is and you are the engineer for the Railroad Commission.

Mr. Cottingham:

Yes, and I came here to hear this case so that I can advise with the Commission.

820 Mr. Tilley:

I know why you came here. The reason I want to question you is because I want to know here and now if there is any of this testimony which you take issue with, and if there is, I am willing to substantiate that testimony by you yourself or any other competent engineer in this State.

Mr. Cottingham:

We will be glad to hear any of the engineers at this time which you have with reference to that and then when the record is made, as one of the Examiners I would be glad to submit that to the Commission for their consideration.

Mr. Tilley:

Mr. Cottingham, you as engineer for the Railroad Commission have within your knowledge peculiar information which isn't available to me and my client and we are not able to go out and hire a high salaried engineer, but I thought you were paid for the purpose of testifying because in every hearing I have been in you have offered your testimony and been subject to cross examination. I only ask for my day in Court to determine whether or not this Commission takes issue with any fact that my client has testified to and if you do, as to whether or not you can know or already know what the sand thickness is in that field, about the permeability and porosity and those matters I want to interrogate you on.

Mr. Burke:

I would like to ask Mr. Rowan one question.

Mr. Tilley:

Let the record show that Mr. Cottingham most respectfully declines to let me cross examine him or his chief engineer.

821 Mr. Cottingham:

I think that is an unfair attitude to take as I am one of the Examiners here. You ask me whether I think his testimony is correct in all its ramifications—

Mr. Tilley:

I wouldn't want to embarrass you.

Mr. Cottingham:

You aren't embarrassing me but I don't think that is a fair attitude to take with reference to me. I came here to hear your case and then you want to ask me what my recommendation is going to be to the Commission.

Mr. Tilley:

No.

Mr. Cottingham:

That is what you are asking.

Mr. Tilley:

I didn't ask that at all. I think I know what your recommendation would be to the Commission, but I don't think the Commission would follow it. I have profound confidence in you as an engineer. What I want to question you about is purely engineering facts that may not be peculiarly within your knowledge but are certainly within your knowledge as far as my client is concerned because he doesn't have all that statistical information and data which you have at your finger tips which you could testify to without referring to any records, and I want the Commission to make that evidence available here but if you can't do that, there isn't a thing I can do about it, and I intend to show you no discourtesy because I have a very profound regard for you.

Mr. Burke:

Mr. Rowan, in the file in the case of Rowan & Nichols vs. the Railroad Commission and R. M. Wood you did have a geologist, a man named Mr. Sorenson, to appear for you and give testimony, didn't you?

Mr. Rowan:

I did not.

8-2 Mr. Burke:

In the trial we had Mr. Sorenson testified, didn't he?

Mr. Tilley:

He never paid Mr. Sorenson one dime. He was the Shell's witness.



Mr. Burke:

He was there at the time and also testified.

Mr. Tilley:

He was there witness.

Mr. Burke:

Mr. Rowan, another question—

Mr. Rauhut:

Just a minute. Who is it that is supposed to have testified?

Mr. Tilley:

Sorenson.

Mr. Rauhut:

Sorenson didn't testify there.

Mr. Burke:

Were you present when we tried that case.

Mr. Rauhut:

No.

Mr. Burke:

How do you know who testified?

Mr. Rauhut:

The only Sorenson I know doesn't work for the Shell.

Mr. Burke:

I don't know who he works for but he was present at that trial. If you weren't present at the trial, how do you know?

Mr. Rauhut:

I think you are mixed up about that. The only petroleum geologist or engineer named Sorenson around here works for the Humble and wasn't in that case.

Mr. Burke:

You say you aren't able to employ an engineer to be here; is that right?

Mr. Rowan:

I didn't say that.

Mr. Burke:

Mr. Tilley made that statement. Is that correct or incorrect?

823 Mr. Rowan:

It depends on how much he would charge me.

Mr. Burke:

You knew this hearing was coming up, didn't you?

Mr. Rowan:

Yes.

Mr. Burke:

You could have employed an engineer, couldn't you?

Mr. Rowan:

I don't know.

Mr. Burke:

You did employ one to compile the facts from which you have testified, didn't you?

Mr. Rowan:

No. I used my own geologist.

Mr. Burke:

You have a geologist in your employ?

Mr. Rowan:

Yes.

Mr. Burke:

What is his name?

Mr. Rowan:

His name is Allen.

Mr. Burke:

And works for you by the month?

Mr. Rowan:

Yes.

Mr. Burke:

You could have had him here.

Mr. Rowan:

Yes.

Mr. Burke:

That is all.

Mr. Tilley:

Mr. Rowan, Mr. Allen has made no particular study of the East Texas field, has he?

Mr. Rowan:

No.

Mr. Tilley:

Didn't you try to employ an engineer in the case you filed against the Railroad Commission and tried to get

a competent man who knew the East Texas field, and his fee was so high you couldn't employ him?

A. That is right.

824 Mr. Tilley:  
That was David Donoghue?

A. Yes.

Mr. Burke:

What fee did he attempt to charge you at that time?

Mr. Tilley:

I don't remember.

A. I don't know. I don't remember.

Mr. Burke:

You don't remember what fee he tried to charge you at that time?

A. No.

Mr. Tilley:

I remember what it was.

Mr. Burke:

I am asking the witness.

A. I don't know.

Mr. Burke:

Then your statement that you just made about you trying to hire an engineer but he charged you so much you couldn't hire him, you are mistaken in that statement, aren't you?

A. No, I'm not mistaken.

Mr. Burke:

If you don't know how much he wanted to charge you to appear, how do you know you couldn't pay him? ]

A. Because I have a recollection of discussing the matter with Mr. Tilley and we talked about expert testimony and I discussed the matter of employing expert testimony and had a conference with Mr. Donoghue and he told me what it would be and we came to the conclusion we couldn't afford to spend the money at that time. I still say I don't know what the fee was going to be. I remember it was something more than I wanted to pay at that time.

Mr. Cottingham:

I don't think that has any bearing.

Mr. Burke:

I don't either but I thought he was very unfair to Mr. Cottingham. It was just to protect Mr. Cottingham.

825 Mr. Cottingham:

I thank you. Even if I wasn't the Examiner in the case like this, I think it is up to an operator to present his own case.

Mr. Tilley:

I merely wanted to protect every legal right my client has and I have examined every witness before the Railroad Commission hearings and I don't believe the Railroad Commission wants the public to know the facts and I want to put this on the basis we are trying to put it on for reasons I will not discuss here and I know just exactly your position and I sympathize with you and have no criticism to make of you.

Mr. Stanberry:

We will take the matter under advisement and make our report on the case but keep it open on the docket in case the Commission wants to hear it after we make our report from the transcript of the testimony, if they

want to hear any additional witnesses and get any additional information, so that they can do so.

Mr. Rauhut:

Would there be further notice of the hearing given in that event?

Mr. Stanberry:

Yes. I don't know whether they will have all the testimony they want or whether they will want to send for Mr. Cottingham to put him on the witness stand.

Mr. Tilley:

I want to make this observation that time is the essence of the thing with my client as we are being unduly drained with a heavy loss and we have tolerated this condition as long as we think we should and we will appreciate it if you will give it prompt attention.

Mr. Stanberry:

Case submitted.

826      The State of Texas,  
            County of Travis.

I, Louise Kirk, an employee of the Oil & Gas Division of the Railroad Commission of Texas, do hereby certify that the above and foregoing is a true and correct transcript of my notes made at the hearing held in Austin, Texas, at 10:30 A. M., May 4, 1938, to the best of my skill and ability.

Witness my hand on this the 9th day of May, A. D. 1938.

(Signed)              LOUISE KIRK.

Sworn to and subscribed before me, a Notary Public in and for Travis County, Texas, on this the 9th day of May, A. D. 1938.

(Signed)

(Seal)

ROSE MODRALL,

Notary Public in and for Travis  
County, Texas.

In line with the request made by him at the hearing, Mr. Rice M. Tilley, attorney for Rowan & Nichols Oil Company, submitted the following statement on May 10, 1938:

"There are 1740 wells on May 1, 1938, having an allowable of from 22 to 23 barrels a day; 430 wells having an allowable of 23 and over. Of the 430 wells, 102 of same have an allowable of 24 barrels and over, while 132 wells have an allowable of exactly 23 barrels. Of the 102 wells having an allowable of 24 barrels and over only 12 wells get as much as 25 barrels and over."

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Service Bureau Report.

Railroad Commission of Texas.

Oil and Gas Division.

Oil & Gas Dockets Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 and 146.

In Re—Conservation and Prevention of Waste of Crude Petroleum Oil and Natural Gas and Relative to the Production, Storage, Transportation, Marketing or Processing of Crude Oil and/or Natural Gas and Relative to the Purchase, Sale, Transportation and Handling of Crude Oil and Natural Gas and all Products, By-Products and Derivatives thereof in the State of Texas.

Statewide Hearing held in the City of Austin, Texas,  
May 17, 1938, 10 A. M.

Before:

Hon. C. V. Terrell, Chairman;

Hon. E. O. Thompson, Commissioner.



## Appearances:

## Name.—Representing.—Address:

- Arnold, F. J., Republic Production Co., Houston, Texas.  
 Adams, E. D., Shelly Oil Company, Houston, Texas.  
 Atkins, J. B., Parado Gasolene Co., Inc., Shreveport, La.  
 Andrade, C., Great State Oil Corp., Dallas, Texas.  
 Allison, R. H., Houston Oil Fields, Houston, Texas.  
 Blair, M. W., Reynosa Oil Company, Wichita Falls.  
 Baker, Rex G., Humble O&R. Co., Houston, Texas.  
 Bass, Perry R., Bass & Dillard, Wichita Falls.  
 Buck, Raymond E., Barnsdall Oil Co., Fort Worth.  
 Barclay, F. C., East Tex. Independent Pet. Assn., Longview, Texas.  
 Cox, Mills, Mills Bennett Prod. Co., Houston, Texas.  
 Cullum, L. H., Perkins & Cullum, Wichita Falls.  
 Cochran, Roy L., Railroad Commission, Kilgore, Texas.  
 Cassidy, Fred M., Honolulu Oil Corp., Midland, Texas.  
 Debach, G. E., Hercules Gasolene Co., Inc., Kilgore, Texas.  
 Donnelly, A. S., Honolulu Oil Corp., Midland, Texas.  
 Daniel, T. B., Jacksonville, Texas.  
 Deputy, P. R., Ralph E. Fair, Inc., Dallas, Texas.  
 Hayes, E. P., The Texas Company, Houston, Texas.  
 Edwards, Haynie E., McElroy Ranch Co., Fort Worth.  
 Fuqua, H. B., Gulf Oil Corporation, Fort Worth.  
 Flesh, Daniel J., Harrison & Marion Co., Jefferson, Texas.  
 Gwilliam, R. C., The Ohio Oil Company, Houston, Texas.  
 Garrett, R. O., Arkansas Fuel Oil Co. & Arkansas Louisiana Gas Company, Shreveport, La.  
 Graham, Guy, Navarro Oil Co., Houston, Texas.  
 Gulcke, J. O., Panhandle Natural Gas Assn., Amarillo, Texas.  
 Hancock, John T. P. Coal & Oil Co., Fort Worth.  
 Johnston, Ralph A., Johnston & Johnston, Houston, Texas.  
 Johnston, Edgar C., E. C. Johnston, Longview, Texas.  
 Jackson, F. G., Longview, Texas.

## Name.—Representing.—Address:

Howard, Del, Cities Service Oil Co., Bartlesville, Okla.  
 Lusk, Dr. C. M., Houston, Texas.  
 Miller, J. S., Devonian Oil Company, San Antonio.  
 Moncrief, W. A., Showers & Moncrief, Inc., Fort Worth.  
 McCarty, J. A., Wichita Falls.  
 McGaha, C. P., Fair McGaha Oil Corp., Wichita Falls.  
 Nichols, Jack, Nichols Oil & Gas, Aramillo, Texas.  
 Noland, J. S., Barnsdall Oil Co., Tulsa, Okla.  
 Neel, Hawley G., West Central Texas Oil & Gas Assn.,  
 Fort Worth.  
 Owens, Joe, Sun Oil Company, Beaumont, Texas.  
 Friddy, W. M., Sabine Royalty & Tyler C. C., Tyler, Texas.  
 Patterson, H. J., Empire Pipe Line Co., Austin, Texas.  
 Pewitt, Paul H., Gladewater.  
 Park, F. D. G., E. C. Johnston, Longview, Texas.  
 Portorfield, R. R., Devonian Oil Company, Midland, Texas.  
 Parker, G. C., Sells Petroleum Inc., Longview, Texas.  
 Parks, A. S., Conroe Operators, Houston, Texas.  
 Rowan, A. H., and Rice, Tilley, Rowan Nichols Oil Co.,  
 Fort Worth, Texas.  
 Richardson, S. W., Fort Worth, Texas.  
 Read, Shelley G., Amazon Petroleum Corp., Henderson,  
 Texas.  
 Reed, Lisle, Peyton Bros., Mexia, Texas.  
 Showers, E. A., Showers & Moncrief, Inc., Houston, Texas.  
 Schroder, J. C., East Texas Independent Pet. Assn., Long-  
 view, Texas.  
 Sefinger, George W., Skelly Oil Company, Tulsa, Okla.  
 Smith, Howard C., Sulphur Springs, Texas.  
 Warner, C. A., Houston Oil Company of Texas, Houston,  
 Texas.

830      Rice M. Tilley, representing A. H. Rowan, The  
 Rowan Nichols Oil Co.

We have asked for an adjustment in the allowable in  
 the East Texas field so as to give our company an oppor-

tunity to produce a fair share of the oil. We are here in view of the fact this affects the field as a whole and made necessary to appear and present our case in the state wide hearing.

I want to present at this time, and I want to be informed if it is not admissible, the record we made on May 4, before the Commission. I have Mr. A. H. Rowan who is ready to testify if required. I wish to say also that we have not yet gotten any relief in East Texas. The East Texas field is on the per well basis and we ask that the Commission relieve the situation as far as it affects us.

A. H. ROWAN, being duly sworn, testified as follows on Direct Examination by Mr. Tilley:

Your company, the Rowan Nichols Co., has leases in East Texas has it not?

A. Yes, sir.

Q. Where is it situated?

A. It is situated on the west line of the Castleberry league and labor survey in Gregg County.

Q. What is its relative position based on the recovery of the oil?

A. In the middle of the field. I may say it is situated in a most favorable position.

Q. How many acres do you have under lease?

A. I have two leases, one of 25 acres and one  
831 of 20 acres.

Q. On your 25 acre lease how many wells do you have?

A. Five.

Q. What is your allowable?

A. 110 barrels.

Q. What would you get under the marginal well basis?

A. 100 barrels.

Q. Under the present order of the Railroad Commission give us the maximum allowable?

A. 100 barrels.

Q. What is the sand thickness or condition over there?

A. The thickness of the sand is approximately 100 feet.

Q. What is the permeability and porosity of this sand?

A. It is uniformly good.

Q. What is the potential production of these wells?

A. One well on an adjoining lease has an actual potential of 965 barrels.

Q. You have as good a potential as is in the field?

A. It ranks nearly to the top.

Q. You have good sand conditions do you not?

A. Yes, sir.

Q. Also with the other oil factors are you not?

A. Yes, sir.

Q. Does your position in the structure have an advantage as compared to the other operators?

A. I think it has.

Q. Are you placed on a parity with the purest oil in the field under the present rules and order?

A. I am placed on a parity with the marginal wells of the purest.

Q. If one of your wells were allowed to recover on the oil in place, how much do you figure your allowable would be?

A. 236 barrels.

Q. You are getting an allowable of 110 barrels now?

A. That is correct.

Q. If you used a factor taking into consideration a potential of as much as 50 per cent, you would get substantially more than you can under this order?

A. Yes, sir.

Q. Have you asked the Commission to look into that?

A. Yes, we made an application and had a hearing on it.

Q. Is this a copy of the record?

A. Yes, sir.

Q. You are a drilling contractor, are you not?

A. Yes, sir.

Q. You are also a producer, are you not?

A. Yes, sir.

Q. You have drilled a number of wells, have you not?

A. Yes, sir.

Q. You understand the underground conditions, do you not?

A. Yes, sir.

Q. You heard the testimony of the Railroad Commission Engineers and others with reference to the East Texas field?

A. Yes, sir.

Q. You base your statements on the knowledge you have?

A. Yes, sir.

Q. If you were given a permit to drill additional wells, would that in any way prevent waste?

833 A. No, sir.

Q. It is useless expenditure to drill additional wells?

A. Yes, sir.

Q. You can produce a fair share of the oil with the wells you have now?

A. Yes, sir.

Q. Spaced according to the regulations of the Railroad Commission?

A. Yes, sir.

Q. Will there be any appreciable amount left if you produce 236 barrels per day with your wells?

A. I would get my fair share of the oil and the field would drain properly.

Q. Would numerous wells create or minimize the fire hazard in this field?

A. These additional wells would create a fire hazard.

Mr. Tilley:

We offer in evidence the affidavit of Mr. A. C. Allen in support of these statements in this record.

Col. Thompson:

Your request is for additional drilling on this 25 acre tract?

A. My request is for the adjustment of the allowable.

Q. You have this 25 acre lease with 5 wells on it?

A. Yes, sir.

Q. Would the density of a tract of about 8 times in size as yours be about the same?

A. It would be approximately the same.

Q. Would it be wrong to say your density is slightly greater than one mile around your lease?

A. I would say about the same.

834 Q. How does the density on your tract compare with the entire field?

A. I have not figured it but I imagine it is about the same.

Q. Would it be wrong to say you have drilled more densely than the entire field?

A. I would say about the same.

Mr. Tilley:

Within five feet of your tract is what is known as the Wood well?

A. Yes, sir.

Q. On what size tract is that well located?

A. My engineer has computed this tract and he has in acreage about  $1/10$  of an acre. We think however that this well is on the Shell property.

Q. This well is given the same allowable as you are, is that right?

A. Yes, sir.

Q. You have been asked as to the density of the surrounding acreage. The East Texas field is a common pool, is it not?

A. Yes, sir; I think so.

Q. If a well is drilled in East Texas you find a similarity of structure and a big part of East Texas will feel the effect of that drainage would it not?

A. Yes, sir. I think it would.

Q. Within two miles of your lease with the same density, and we know that because they are thickly drilled with wells, would that not injure your recovery?

A. I think it would.

Q. Does the density have anything to do with 835 the amount or recovery if uniformly drilled?

A. I don't think so, you should have uniform spacing and uniform drilling.

Q. You are being denied the opportunity to get your fair share of the oil in spite of the fact some are dense and some are not?

A. Yes, sir.

Col. Thompson:

Is it your request that those wells on small tracts be given small allowables and the wells on the larger leases be given the larger allowables?

A. Each well should get a fair share of the oil.

Q. If one well is on a 5 acre tract and another is on a City lot, the 5 acre tract should be given more allowable than the City lot?

A. That is correct.

Q. This is the same acreage proration argument we have had with us for many years.

A. Yes, that is my position.

Q. Would they want that?

A. The sand thickness should be considered in this proration. That is a fair and more equitable to East



Texas. One should not be allowed to drill three or five wells on five acres on any sectionized and to my one well on one acre.

Q. You understand the rule we have been trying to use is to take an area 8 times the size of the tract in question?

A. That is true but not right.

Q. We take all the field density to approximate the result you have?

836 A. I don't think so.

Q. It is an attempt to do that?

A. I don't think it does it.

Q. But our attempt is interfered with because there are town lots and small tracts which we are required to deal with alone.

A. Yes, but that would be two or three wells.

Q. The Commission has refused these wells on these small tracts and they go to Court and get them.

A. I have not stated that.

Q. This causes the Commission to be tied in not promising or permitting them to drill.

A. They should not be allowed two or three wells on the small tracts less than the spacing rules.

Q. The agreement has been changed recently and there are now more than 1141 independent producers than there were two years ago?

A. I had an idea they were going light.

Q. Our records show there are 1141 more independent operators than there were two years ago.

A. That may be true.

Q. What we have tried to do is to handle this situation so as to please every one and to get each one an opportunity to get some oil.

A. I admit you have a hard job.

Q. We are trying to gather the oil, but everytime you bring in a well you increase the production. What do you think of setting the top allowable in Texas?

A. I think it is a good idea.

837 Q. Will more wells drilled in reduce the allowable on each well?

A. Yes, sir.

Q. You would suggest then a figure that can not be exceeded?

A. Yes, sir.

Q. Would you suggest such a change or policy to the Commission?

A. Yes, sir.

Q. How would it work out in the KMA field?

A. It would have to be raised from time to time as the limits of the field are extended, and as new production develops and the reservoir conditions are determined. It might be necessary to increase the top allowable, but when the maximum had been reached without physical waste, taking into consideration the market demand.

Mr. Tilley:

You base your testimony on the fact that you are entitled to your fair share of the oil and that East Texas should be prorated in accordance with the rules and not redistributing the wealth to the operators?

A. Yes, sir.

Q. The driller on the small area should get his cost back?

A. I don't think so.

Q. If a man drills a well on say 1/10 of an acre and does not get a well to pay him back the cost of this drilling?

A. He is as foolish as trying to build a large hotel in the middle of the desert and expecting people to come there.

Q. Mr. Wood is encroaching on your property is he not?

A. Yes, sir.

838 Col. Thompson:

Suppose a man had a tract in East Texas, say a 30 foot Church lot; under your theory, which you have suggested, that he be allowed to recover the oil under that tract, and his allowable is so small that he can not drill the well; where will he find a market for his land. Who would buy it, would anyone buy it?

A. I doubt it.

Q. Then the others on the adjoining tracts would get his oil and he would receive nothing for it.

A. Unless the rules would permit the consolidation with another tract and drilling for the benefit of all parties.

Q. You understand the statute prohibits us from having compulsory consolidation?

A. It is being done.

Q. That is a voluntary consolidation?

A. Yes, sir.

Q. The man does not want to voluntarily come in and we could not compel him to come in and no one would buy his land, and he could not get his oil without drilling?

A. Yes, that is right.

Q. If the man does drill on this 1/10 of an acre and his allowable is fixed so as to take into consideration his size and ability to produce can he not be given a fair share of the oil?

A. Yes, sir.

Q. Do you know the taxable values of Gregg County?

A. No, sir.

Q. It was 8,000,000 dollars in 1931, was it not?

A. Yes, that is correct I think.

Q. Do you know what it is today?

839 A. It is 88,000,000 dollars.

Q. That is a great benefit to the business?

A. It is a lot for the people.

Q. Would fair drilling rules be of benefit?

A. No, sir.

Mr. Allison:

In my opinion the State of Texas does not prohibit the order of the Railroad Commission requiring the compulsory policy for the smaller tracts to carry out the uniform spacing and further more the Commission had issued such an order in the Hastings pool near Houston and it was up for hearing in the Federal Court and they held that the Railroad Commission had the power to require the pooling of the smaller tracts.

Col. Thompson:

Did not that involve some city ordinances or something like that.

Mr. Allison:

There was one order passed by the City of South Houston and another order passed by the Railroad Commission of Texas, an independent order. The case was filed under one order and the cases were separated in the Court because the City order required a One Judge Court and the order of the Railroad Commission required a Three Judge Court. The One Judge Court had heard the order of the South Houston, and the other Court tried the independent order of the Railroad Commission. However independent of this under the present statutes the Railroad Commission has the power to compel, or they have full authority under the present statutes to require uniform spacing and take from the smaller operator

840 and save his money.

Col. Thompson:

Did you say save his money?

A. Yes, sir.

Q. By securing to him the right to drill for oil?

A. He has one well on 5 or 10 acres instead of four.

Q. He might not get out of that well the cost of the drilling?

A. The Railroad Commission selects the driller.

Col. Thompson:

We select the driller? I have never read into the statute that we must pick a driller for any one to drill his wells for him.

A. If you have a hearing and issue an order and have entered your decision for the drilling of one well.

Col. Thompson:

I will tell you what we did. Recently South Houston has passed a city ordinance against fire hazards, and have adjudged them to be dangerous to the city of South Houston. We recognized the lower unit of Government's order. That was all we had to do, and we did it, but it was on account of the city ordinance with reference to a fire hazard.

Mr. Allison:

You have the same power, and a higher power than they have. Here is the thing that should be kept in mind the effect of the order of the Commission in the drilling of unnecessary wells, is the same as the confiscation of property.

Col. Thompson:

Whose property is being confiscated. We have not done anything like that.

Mr. Allison:

This drilling of unnecessary wells is the same.

841 Mr. Tilley:

I don't think it is my province to tell you what the law is. I think you have a most competent Attorney General to tell you what the law is. We most vigorously urge no inhibitions or prohibitions which will keep this Commission from adjusting the allowable for all of East Texas. It is not acreage production. It is a combination

of those factors which if used by this Commission and might have been used in the other fields, and if used in this field, will give an allocation of the allowable in this field.

### Certification.

The State of Texas,  
County of Travis.

I, a Notary Public in and for Travis County, Texas, hereby certify that I have compared and found the foregoing writing to agree and be a true verbatim copy of, and the whole of, the Transcript of Testimony taken at the Statewide Proration Hearing held by the Railroad Commission of Texas on May 17, 1938, in Austin, Texas, as is on file in the offices of the Railroad Commission of Texas in Austin, Texas.

Given under my hand and Seal of Office on this, the 21 day of May, A. D. 1938.

(Signed)

EMMA RUTH HAMNER,

(Seal)

Notary Public, Travis County,  
Texas.

842 Before the Railroad Commission of Texas.  
Oil and Gas Division.

In the Matter of: Application of Rowan & Nichols Oil Company for adjustment in allowable and, alternatively, for twenty permits as exceptions to Rule 37.

No. 23,545 and East Texas Proration Docket No. ....

Comes now Rowan & Nichols Oil Company, applicant in the above styled and numbered application, heretofore filed with the Railroad Commission of Texas on February 24, 1938, and moves that the action of the Railroad Comi-



mission of March 17, 1938, in denying applicant's request for an adjustment in the allowable of what is known as its Todd "B" lease, consisting of 24.99 acres, Castleberry Survey, Gregg County, Texas, and denying its alternative request, in the event said applicant had no lawful right to an adjustment of allowable, for twenty permits to drill wells as an exception to Rule 37 on said lease, and the granting of only its application for Well No. 6 as an equidistant offset to the R. M. Wood Well No. 1, Wood Fee, Castleberry Survey, Gregg County, be set aside and held for naught, for the following good and sufficient reasons:

#### I.

Applicant has drilled and is producing five wells on said lease, in accordance with the rules, regulations and orders of the Railroad Commission.

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#### II.

Said lease is located in what is known as the Glade-water Nose, and the "fairway," with an average sand thickness underlying said lease of one hundred (100) feet, and an average potential per well on said lease of 964 barrels, and with a present allowable on said lease for all five wells of 112 barrels per day.

#### III.

Taking into consideration the elements of porosity, permeability, oil saturation, and thickness of sand underlying said lease, applicant is not receiving and does not have an opportunity equal to other operators and lease owners in the field, to recover its fair share of the oil.

#### IV.

Applicant is entitled to that proportion of the total daily allowable for the East Texas Field as the recoverable



oil under its lease bears to the total recoverable oil in the East Texas Field, but under the present proration orders and the basis therefor, applicant is being deprived of said equal opportunity without due process of law, and is not receiving the equal protection of the laws guaranteed to it by the Constitution and laws of the State of Texas and of the United States.

## V.

Applicant can produce from the wells now producing on its lease without waste, that proportion of the total daily allowable that the recoverable oil under its lease bears to the total recoverable oil in the East Texas Field, without the necessity of drilling additional wells.

## VI.

The granting of its application for Well No. 6, and the production of oil therefrom, under the present basis of proration, will continue to deprive and does not grant and will not guarantee to applicant an equal opportunity to recover its fair share of the oil, and results in the Railroad Commission's depriving applicant of producing per day that proportion of the daily allowable that the total recoverable oil under its lease bears to the total recoverable oil of the East Texas Field, unjustly, inequitably, and contrary to the Constitution and laws of the State of Texas and the United States.

Wherefore, applicant prays that this motion for rehearing be granted, that the order of the Commission heretofore entered on March 17, be set aside and held for naught, and that upon rehearing, the statewide proration order made by said Commission on the 22nd day of March, 1938, on hearing held at Austin on March 19, 1938, be set aside

and re-entered or amended so as to give applicant the relief sought at said hearing.

It is also most respectfully urged and prayed that in view of the litigation pending involving, and various claims to, the title to the southern part of applicant's lease and the bona fide title dispute that R. M. Wood claims exists, the Railroad Commission inform this applicant just where the Well No. 6 granted to applicant would be.

Respectfully submitted,  
RICE M. TILLEY,  
PHILLIP TOCKER;

Attorneys for Applicant,  
Rowan & Nichols Oil  
Company.

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## EXHIBIT 5.

Schedule of Allowable Production in the East Texas Oil Field According to Proration Schedule Dated January 1, 1939.

No. wells less than 20 bbls. daily .....	463
No. wells, 20 bbls. but less than 21 .....	21,179
No. wells, 21 bbls. but less than 22 .....	2,000
No. wells, 22 bbls. but less than 23 .....	1,831
No. wells, 23 bbls. but less than 24 .....	319
No. wells, 24 bbls. but less than 25 .....	96
No. wells, 25 bbls. or over .....	22
Total wells .....	25,910

## EXHIBIT 6.

Allowable .....	522.591 Bbls.
Sub-Marginal wells—463 .....	
Allowable—do .....	5.395
Net Prorated Allowable .....	517.196
No. Wells .....	25,910
Sub-Marginal .....	463
	<hr/>
	25,447
25447 wells @ 20 Bbls.= .....	508,940
Bbls. to be allotted to Potential = .....	8,256
Percentage of Potential Allotment to Net prorated Allowable = .....	1.61%

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## EXHIBIT 13.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket No. 120.

In Re: Conservation and prevention of waste of crude oil  
and natural gas in the East Texas field, in Upshur,  
Gregg, Rusk, Smith and Cherokee Counties, Texas.

Austin, Texas, March 9, 1933.

Special Order Adopting Rules and Regulations Governing  
Production of Crude Oil in Said Field Following  
Hearing on February 23rd and 24th, 1933.

This Commission having considered evidence adduced at  
hearing held in above cause on February 23rd and 24th.

1933, as to the demand for crude oil from the East Texas Field and the method of distribution of the same to the wells or leases therein, and having considered all of the testimony adduced at said hearing and other previous hearings, and having considered all conditions existing in said field and all factors necessary to a proper determination of the allowable daily production of crude oil from said field during the next ninety (90) days and the distribution thereof, including bottom hole pressures, and permeability and porosity reflecting the capacity of a well to produce, and sand thickness, which takes into account the position of the well on the structure, is of the opinion and so finds that to prevent waste and to bring the production of said field more nearly in conformity with the actual demand for crude oil from said field and secure a more orderly and equitable production program therein, the daily allowable production thereof should be limited and regulated as hereinafter appears.

847. Therefore, it is Ordered by the Railroad Commission of Texas that effective at seven o'clock A. M., March 10, 1933, and continuing until 7 o'clock A. M., June 1, 1933, unless sooner changed by order of this Commission, based on other findings of fact which may be ascertained by it, as to market demand or waste as defined by law, Rule 27 as adopted by previous order is hereby changed so as to hereafter read as follows:

Rule 27. For the period indicated above, the aggregate production of all wells in the East Texas field, as defined by orders heretofore entered governing the same, shall not exceed Four Hundred Thousand (400,000) barrels of crude oil daily. The Commission, through its agents in the field, will issue schedules effective at seven o'clock A. M., on the 19th day of March, 1933, and on the first days of April and May, 1933, to govern production of each and every lease

or property therein during said months according to a combined bottom hole pressure, sand thickness, and per well allowable basis as follows:

(a) Forty barrels per well shall first be allotted to all marginal wells.

(b) The remainder of the aggregate allowable production for the entire field as above fixed, after deducting the marginal well allowance, which remainder will hereafter be called "proratable allowable," shall be allotted to all wells in the field as follows: For the schedule for

each period above defined the daily well allowable shall be computed as follows: The Commission

or its duly accredited agents in the field, effective at the beginning of each period shall ascertain the number of wells capable of producing oil, as of the first day of such period and the sum of the total wells capable of producing oil on the first day of each period, plus the probable completion during such period, shall be divided into one-third (1/3) of the proratable allowable. The quotient resulting therefrom shall be the daily well allowable for such period, and each well shall be entitled to produce during such period its daily well allowable so computed plus the amount provided for in Paragraph (c) hereof.

(c) The other two-thirds (2/3rds) of the proratable allowable shall be allotted to wells in said field in accordance with the following scale:

Allotment basis  
pressure:

1000 lb. equals 9 bbls.

1100 lb. equals 10 bbls.

1200 lb. equals 11 bbls.

1300 lb. equals 12 bbls.

Allotment basis  
sand thickness:

20 ft. equals 9 bbls.

40 ft. equals 10 bbls.

60 ft. equals 11 bbls.

80 ft. equals 12 bbls.

1400 lb. equals 13 bbls.

1500 lb. equals 14 bbls.

100 ft. equals 13 bbls.

Illustrative Scale for application of above allotments.

1 well 1000 lb. pressure	20 ft. sand equals 30.8 bbls.
1 well 1100 lb. pressure	20 ft. sand equals 31.8 bbls.
1 well 1200 lb. pressure	20 ft. sand equals 32.8 bbls.
1 well 1200 lb. pressure	40 ft. sand equals 33.8 bbls.
1 well 1300 lb. pressure	40 ft. sand equals 34.8 bbls.
1 well 1300 lb. pressure	60 ft. sand equals 35.8 bbls.
1 well 1400 lb. pressure	60 ft. sand equals 36.8 bbls.
1 well 1400 lb. pressure	80 ft. sand equals 37.8 bbls.
1 well 1400 lb. pressure	100 ft. sand equals 38.8 bbls.
1 well 1500 lb. pressure	20 ft. sand equals 35.8 bbls.
1 well 1500 lb. pressure	40 ft. sand equals 36.8 bbls.
1 well 1500 lb. pressure	60 ft. sand equals 37.8 bbls.

Agents of the Commission will secure representative bottom hole pressure data uniformly throughout said field in such manner as the Commission may direct; will divide the field into pressure zones, and estimate the average pressure of the field.

Sand thickness shall be ascertained by agents of the Commission for the purpose of application of the formula hereinafter adopted in such manner as the Commission may direct.

Until the necessary data can be assembled and the above plan of distributing the aggregate daily allowable production from said field made effective March 19, 1933, no well in said field shall produce in excess of Thirty-six (36) barrels per day.

The allowable production for each lease or separate property shall be the aggregate production of all wells therein.

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All existing general and special orders governing said field not in conflict with the terms of this order are hereby readopted and all of the terms of such orders in conflict herewith are hereby annulled.

It is Further Ordered that any interested party who is dissatisfied with this order or with the administration thereof, shall notify the Commission, through its Chief Supervisor at Austin, Texas, or its Deputy Supervisor in said field in writing so that the Commission may, if the facts and the law so justify, take such action as will satisfy the complaining party.

If any operator in said field shall have reason to believe that the Commission has made an error in the measurement and calculation of the bottom hole pressure and or sand thickness of his well or wells, it shall be the duty of such operator to make known to the Commission, the alleged error, whereupon the Commission will make correction of such error if and when it has had satisfactory proof thereof, consisting of the true measurements or calculations made in collaboration with or under the supervision of agents of the Commission, or such other persons as the Commission may designate, the service of such agents or others to be furnished or designated by the Commission upon written request therefor.

This cause is hereby held open upon the Commission's docket for the adoption of such supplemental or amendatory orders as in the Commission's judgment may be required under evidence adduced in hearings herein.

RAILROAD COMMISSION OF  
TEXAS.

(Seal)

By C. V. TERRELL,

Commissioner.

ERNEST O. THOMPSON,

Commissioner.

Attest:

C. F. PETET, Secretary.



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## EXHIBIT 14.

State of Texas,  
Railroad Commission of Texas,  
Austin.

Rec'd. Mar. 20, 1938.

#6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22,  
23, 24, 25 B. C. Todd et al.

Wm. H. Castleberry Survey, Gregg County, Texas.

Case No. 25,545.

Rule 37.

Applicant: Rowan & Nichols, 903 Trinity Life Building,  
Fort Worth, Texas.

The application of Rowan & Nichols for an exception under the provisions of Rule 37, coming on to be heard on the 11th day of March, 1938, by the Railroad Commission of Texas, and it appearing that the petition shows good cause; that no injustice will be done by the granting of such exception, and that same should be granted to prevent confiscation of property:

Now, Therefore, it is Ordered, that the application of Rowan & Nichols for an exception under the provisions of Rule 37 and a permit to drill well No. 6, B. C. Todd et al Lease, containing 25 acres of land out the Wm. H. Castleberry Survey in Gregg County, Texas, as shown by

plat submitted, is hereby approved and applicant is granted permission to drill well No. 6 to be spaced as follows:

As a direct northwest and equidistant offset to R. M. Wood No. 1, fee.

It is Further Ordered that all other requests are hereby denied.

Entered at Austin, Texas, on this the 17th day of March, 1938.

C. V. TERRELL,  
Chairman.

LON A. SMITH,  
Commissioner.

.....  
Commissioner.

Attest:

C. F. PETET,  
Secretary.

The above and foregoing is a true and correct copy of an order of the Railroad Commission of Texas, entered on the above date.

(S.) LATEN STANBERRY, j.  
Chief Supervisor, Oil and  
Gas Division.

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State of Texas.  
Railroad Commission of Texas,  
Austin.

Motion for Rehearing by Tilley and Tocker, Attorneys for  
Rowan and Nichols Oil Company, Applicant.

Rec'd. Apr. 8, 1938.

Case No. 25,545.

Rule 37.

Applicant: Rowan & Nichols Oil Company, 903 Trinity  
Life Building, Fort Worth, Texas.

Motion for rehearing in the above numbered case having this date been considered by the Railroad Commission of Texas, and it appearing that the reasons set out in said motion are sufficient to justify the granting of a rehearing covering the application of Rowan & Nichols Oil Company for an adjustment of allowable or in lieu thereof, special permit to drill wells Nos. 7 to 25 inclusive on the B. C. Todd et al lease, containing 25 acres of land out of the Wm. H. Castleberry Survey in Gregg County, Texas;

Now, therefore, it is Ordered that the motion for rehearing filed by Tilley and Tocker, Attorneys for Rowan & Nichols Oil Company, applicant in the above numbered case, is hereby granted.

Entered at Austin, Texas, on this the 31st day of March, 1938.

C. V. TERRELL,  
Chairman.

LON A. SMITH,  
Commissioner.

ERNEST O. THOMPSON,  
Commissioner.

Attest:

C. F. PETET,  
Secretary.

The above and foregoing is a true and correct copy of an order of the Railroad Commission entered on the above date.

(S.) LATEN STANBERRY,

Chief Supervisor, Oil and  
Gas Division.

em

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EXHIBIT 16.

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Railroad Commission of Texas.  
Oil and Gas Division.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Oil and Gas Docket Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 & 146.

=20 - 397.

Austin, Texas, August 29, 1938.

Special Order Fixing the Allowable Production of Crude  
Oil in the Various Fields and Districts in Texas.

Whereas, after due notice, hearings have been held in Austin, Texas, at various times, including the hearing on August 19, 1938, with respect to the existence and imminence of waste of oil and gas in the State of Texas, and the prevention thereof; and

Whereas, in view of the evidence, including among other matters the physical conditions in the various fields, the transportation and marketing facilities, the reasonable market demand, the reasonableness of the allocation as between fields of the allowable production under previous orders; and

Whereas, The Railroad Commission of Texas finds from the evidence that the reasonable market demand for oil produced in this State from the various fields and districts therein equals the amount hereinafter shown as the allowable production thereof during the period beginning at 7 o'clock a. m., September 1, 1938, and until further ordered; and

Whereas, The Railroad Commission of Texas finds that waste exists and is imminent and that to prevent such waste of oil and gas as the same is defined by the applicable Statutes, it is necessary to restrict the production of oil in the State of Texas to the reasonable market demand:

Therefore, it is Ordered that beginning at 7 o'clock a. m., September 1, 1938, and until further ordered, the production of oil in the State of Texas and the various fields shown, shall be as hereinafter shown Except as provided for in the Commission's order of August 29, 1938, entitled "General Order Shutting Down All Oil Wells in the Various Fields and Districts in the State of Texas on September 3rd, 4th, 10th, 11th, 17th, 18th, 24th and 25th.

Rule 2 of Division 2, as contained in an order of this Commission dated October 17, 1933, pertaining to the Panhandle District of Texas is hereby re-adopted and amended as follows:

Rule 2. Not more than Eighty Thousand Seven Hundred Sixty-three (80,763) barrels of crude oil shall be produced from said district during any day of the effective period of this Order. Moore County shall not produce in excess of One Thousand Five Hundred Twenty-nine (1529) barrels daily. Moore County allowable is in addition to Panhandle allowable. The Osborne Area

in Wheeler County shall not produce in excess of Six Hundred Twenty (620) barrels of crude oil daily. The Osborne Area allowable is in addition to the Panhandle allowable.

2. Rule 23 (a) of Division 3, as contained in an order of this Commission dated October 17, 1933, pertaining to the East Texas Field is hereby re-adopted and amended as follows:

857       Whereas, The Railroad Commission of Texas finds from evidence submitted to it at a hearing held in Austin on August 19, 1938, and at previous hearings held before the regulatory body that the reservoir of the East Texas Field has its energy supplied by a hydrostatic drive which encroaches from the west to the east, and only a certain amount of crude oil can be withdrawn daily from the East Texas Reservoir in order to utilize to the greatest extent the energy necessary for the production and recovery of the greatest amount of oil ultimately from the reservoir. It has been recommended to the Commission by competent engineers that not more than 425,000 to 450,000 barrels of crude oil should be allowed to be produced from the East Texas Reservoir in any one day in order that the reservoir might be depleted with the least possible amount of waste incurring. Evidence has also been submitted to the Commission at these hearings that the production of from 425,000 to 450,000 barrels of crude oil will prohibit the coning of water, the uneven encroachment of water, and the subsequent trapping of much oil with otherwise, under higher daily allowables of crude oil, would not be recovered.

Rule 23 (a). Therefore, it is Further Ordered by the Railroad Commission of Texas that during each twenty-four (24) hour period beginning at 7 o'clock a. m., Cen-

tral Standard Time, September 1, 1938, the owner or operator or manager of each well in the East Texas Field shall be permitted either collectively or individually, to produce daily from each well, a maximum of Two and Thirty-two Hundredths (2.32%) Per Cent of its hourly potential capacity as determined by the Commission.

3. Rule 2 of Division 5, as contained in an Order of this Commission dated October 17, 1933, pertaining to the North Texas District is hereby re-adopted and  
858 amended as follows:

Rule 2. Not more than Eighty-eight Thousand and Eight (88,008) barrels of crude oil shall be produced from said district during any day of the effective period of this order, which is distributed in the following manner:

North Texas Proper, Anderson-Kerr, 65,747.  
Gant Pool, 340.  
Foard County, 688.  
K. M. A., 21,233.

4. Rule 2 of Division 6, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Central Texas District is hereby re-adopted and amended as follows:

Rule 2. Not more than Seventy-nine Thousand and Sixty-seven (79,067) barrels of crude oil shall be produced from said district during any day of the effective period of this order, which is distributed to the various counties as follows:

Brown .....	2086	McCullough .....	25
Callahan .....	1450	Palo Pinto .....	370
Coleman .....	1217	Reagan (Big Lake)...	7500



Comanche .....	79	Reagan (Grayson)...	151
Crockett (Crockett)...	266	Runnels .....	147
Crockett (Todd) .....	0	Shackelford .....	7396
Crockett (Simpson) ..	50	Stephens .....	4393
Crockett (World) ....	1047	Stonewall .....	100
Eastland .....	2973	Taylor .....	74
Erath .....	76	Throckmorton .....	399
Irion .....	40	Upton (McCamey)...	19662
Fisher .....	4215	Upton (Herrington Ex-	
Haskell .....	227	tension) .....	196
Hurdle .....	245	Webb Ray .....	79
Jack (So. Half) .....	9939	Young (So. Half)....	7401
Jones .....	7264		

Rule 4 of Division 7, as contained in an order of the Commission dated October 17, 1933, pertaining to the West Texas District is hereby readopted and amended as follows:

Rule 4. Not more than Two Hundred Twenty Three Thousand Five Seventy Eight (223,578) barrels of crude oil per day shall be produced from said district during any day of the effective period of this Order, which shall be distributed to the various fields therein as follows:

Pashara .....	176	McClintic .....	1211
Bennett .....	2978	Monroe .....	24
Carter .....	20	Moore .....	80
Church Fields .....	6633	Netterville .....	378
Cowden, North .....	8735	Northwest .....	39
Cowden, South .....	347	Parker .....	33
Cowden, Crane .....	2357	Payton .....	1216
Dean .....	80	Pecos Valley .....	993
Deep Rock .....	236	Penwell .....	4710
Dobbs .....	9	Richards .....	0
Duggan .....	518	Sand Hills (Permian)	1293

Edwards	10	Sand Hills (Ordovic-	
Emperor	1558	ian)	260
Estes	8510	Scanlan	0
Evans	371	Scarborough	2075
Foster	6526	Sealey	503
Fuhrman	1554	Seminole	511
Garza County	41	Shearer	98
Goldsmith	21812	Shipley	1688
Gulf-McElroy	4422	Slaughter	683
Halley	559	Snyder	1486
Harper	11954	Taylor-Ling	1300
Hendricks	12000	Tobarg	2048
Henderson	3500	Waddell	1469
Howard-Glasscock	17773	Ward, North	6706
Iatan-E. Howard	7807	Ward, Sough	12320
Johnson	43	Wasson	7828
Jordan	2586	West	60
Kermit	20074	Westbrook	922
Keystone	3365	Wheat	1527
Leck	340	White-Baker	0
Mason	395	Wilson	0
Masterson	618	Yates	21072
Means	2988	Yates (Smith Sand)	150

6. Rule 2. of Division 4, as contained in an order of this Commission dated October 17, 1933, pertaining to the East Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than One Hundred Twelve Thousand One Hundred Sixty Three (112,163) barrels of crude oil per day shall be produced from said field in said district during any day of the effective period of this order. Said amounts shall be allocated to the various fields in the following amounts:

Boggy Creek	450	Post Oak	10
Bolivar	28	Powell	2163

Cayuga .....	11059	Potter .....	162
Collinsville .....	10	Percilla .....	24
Corsicana Shallow ...	435	Richland .....	25
Curry .....	122	Rodessa .....	31996
Flag Lake .....	583	Rusk .....	92
Ginter .....	50	Sulphur Bluff .....	6205
Grapeland .....	100	Shelbyville .....	30
Huntington .....	18	South Bosque .....	18
Lone Star .....	..	Talco .....	33,661
Long Lake .....	2787	Trinity .....	757
Lott .....	70	Van .....	18725
Mexia .....	1948	Van Shallow .....	142
Navarro Crossing ....	200	Waskom .....	114
Opelika .....	30	Wortham .....	85
Panola .....	47	Wortham (Shallow)...	72
Pottsboro .....	5		

7. Rule 2 of Section "A" of Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Southwest Texas District is hereby re-adopted and amended as follows:

Rule 2. Not more than Two Hundred Ninety Two Thousand Eight Hundred Five (292,805) barrels of crude oil shall be produced in said district during any day of the effective period of this order and same shall be distributed as follows:

#### Division I.

Alta Vista .....	4	Hantho-Nelson .....	0
Bateman .....	135	Hilbig .....	396
Batesville, New .....	5	Jacobs .....	616
Berlin, New .....	0	Jones .....	3
Bob Rose .....	10	Kimbrow .....	11
Buchanan .....	240	Larremore .....	81
Burdett Wells .....	38	Loma Alto .....	115

Calliham .....	215	Lost Mule .....	0
Carroll .....	60	Luling Branyon .....	11857
Carver-Kallison .....	143	Lytton Springs .....	342
Cedar Creek .....	29	Manford .....	22
Cedar Creek No. ....	39	Matthews .....	24
Chapman-Abbott ....	252	Minerva Rockdale ....	200
Chicon Lake .....	21	Noack .....	89
Clark .....	145	Pearsall .....	693
Darst Creek .....	9011	Salt Flat .....	5107
Deupree .....	41	Somerset .....	674
Dale .....	171	Southton .....	64
Dale, West .....	230	Spiller .....	64
Dunlap .....	180	Staples .....	1
Dunlay .....	39	Riddle .....	148
Eckert .....	159	Taylor Ina .....	8
Ellison-Young .....	155	Thrall .....	39
Ezzell .....	4507	Von Ormy .....	193
Espada, Mission .....	1	Von Ormy .....	75
Fairfield .....	7	Walnut Creek .....	48
Gas Ridge .....	8	Zoboroski .....	137

## Division II.

Burnell, South .....	1099	Mt. Lucas .....	69
Caesar .....	324	Normanna .....	45
Colletto Creek .....	619	Oakville .....	138
Cordeil .....	588	O'Connor McFadden ..	248
Diamond Half .....	477	Pettus .....	835
Dinero .....	77	Pettus New .....	1164
Dirks .....	2679	Placedo .....	9493
East Tolfner .....	120	Placedo, East .....	392
Ganado .....	44	Plummer .....	286
Greta .....	8294	Port Lavaca .....	58
Greta Deep .....	361	Ray .....	438
Heyser .....	11300	Refugio-Fox .....	843
Holzmark .....	34	Refugio-New .....	3977

Hordes Creek	49	Refugio-Old	1515
Keeran	611	Sarco	0
McMurray	4	Shack	10
McFadden	1568	Tom O'Connor	15538
McNeil	82	Tuleta	502
Mauritz	176	Vanderbilt	73
Mineral	0	Voss	25

## Division IV.

Agua Dulce	47	London	75
Albercas	61	Loma Novia	15253
Alfred	278	Lopez	7225
Alice	2058	Los Olmos	125
Alta Mesa	668	Loma Vista	10
Alta Verde	12	Luby	7128
Angelita	21	Lundell	476
Aransas	7429	Midway	1028
Aviators	371	Mirando City	455
Baldwin	472	Mirando Valley	278
Barbacoas	9	Moca	446
Benavides	13665	Nelson	17
Bruni	605	O'Hern	7704
Bruni East	345	Oilton	2867
Captain Lucey	271	Las Animas	75
Carolina-Texas	8	Peters	132
Casa Blanca	611	Piedre Lumbre	1296
Chapman	74	Piedras Pintas	2
Charamousca	342	Plymouth	13305
Charco-Redondo	14	East Premont	264
Clara Driscoll	1523	Premont Prospect	702
Clara Driscoll So.	667	Rancho Solo	16
Cole Middle	20	Randado	327
Cole West	457	Ricaby	7
Colmena	362	Richard King	472
Colorado	319	Rio Grande City	110
Comitas (Haynes)	743	Rincon	98

Corpus Christi	4553	Roma	1
Cuellar	115	Sandia	13
Driscoll	1397	Sarnosa	768
Eagle Hill	424	Sam Fordyce	3566
El Tanque	268	Sam Fordyce North	343
Escobas	1418	Saxet	19893
Fitzsimmons	612	Saxet Frio	20647
Flour Bluff	5927	Seven Sisters	8874
Govt. Wells No.	8810	Seven Sisters So.	594
Govt. Wells So.	4725	Sinton	8
Henne-Winch-Farris	14	Stratton	410
Guerra	837	Sullivan	108
Hoffman	3692	Sweden	286
Jennings	1068	Taft	2766
Killam	1352	Tesoro	196
Kingsville	69	Thomas Lockhart	5
Kohler	114	Turkey Creek	3708
Kohler Deep	51	White Point	28
Labbe	320	White Point East	1960
Laurel	11		

8. Rule 2 of Section A, Division 9, as contained in an Order of the Commission dated October 17, 1933, pertaining to the Gulf Coast District is hereby readopted and amended as follows:

Rule 2: Not more than Two Hundred Fifty Four Thousand Eight Hundred Thirteen (254,813) barrels of crude oil shall be produced from said field of said district during any day of the effective period of this order, which shall be distributed as follows:

Allen Dome	12	Lost Lake	135
Amelia	4399	Louise	1560
Anahuac	9832	Lovell's Lake	127
Ariola	564	Livingston	2362

Armour .....	167	Magnet .....	1194
Bammel .....	98	Manvel Miocene .....	5884
Barson .....	1136	Manvel Oligocene .....	5445
Batson New .....	1118	Markham .....	1922
Barbers Hill .....	10762	Mykawa .....	200
Bay City .....	2726	Mykawa New .....	1447
Big Creek .....	728	Nash Dome .....	-0-
Big Hill .....		Nome .....	1764
Blue Ridge .....	802	North Dayton .....	120
Boling .....	2010	Old Ocean .....	5328
Brenham .....	35	Orange .....	697
Brookshire .....	10	Orange West .....	1080
Buckeye .....	196	Orchard .....	350
Call .....	49	Palacios .....	120
Cedar Point .....	457	Pickett Ridge .....	1620
Cheek .....	106	Port Neches .....	1274
Clam Lake .....	98	Port Neches West .....	148
Clay Creek .....	663	Pierce Junction .....	5216
Cleveland .....	450	Raccoon Bend .....	1598
Clinton .....	468	Raccoon Bend (Cock-	
Conroe .....	39368	field) .....	2460
Cotton Lake .....	645	Rockland .....	
Cotton Lake So. ....	1157	Sandy Point .....	385
Damon Mound .....	366	Saratoga .....	1008
Danbury Dome .....	588	Satsuma .....	364
Dickinson .....	5275	Schwab .....	78
Esperson Dome .....	1608	Seabreeze .....	226
Eureka Heights .....	1101	Segno .....	2211
Fairbanks .....	4131	Segno Deep .....	150
Fannet .....	719	Shepherd's Mott .....	-0-
Gillock .....	3744	Silsbee .....	2166
Goose Creek .....	2075	Sour Lake .....	1491
Greens Lake .....	19	South Houston .....	3861
Hamman .....	1976	South Liberty .....	673
Hankamer .....	1328	Spindletop .....	2926
Hankamer New .....	264	Sugarland .....	3994
Hardin .....	5488	Thompsons .....	13108



Hardin West .....		Tomball .....	8924
Hastings .....	24333	Turtle Bay .....	1430
High Island .....	2690	Webster .....	3763
Hitchcock .....	686	West Beaumont .....	1728
Hull (Old) .....	3376	West Columbia .....	2186
Hull (New) .....	7640	West Columbia New..	3618
Humble .....	4362	West Columbia Vicks.	39
Joe's Lake .....	1070	Wilson .....	73
Kubela .....	702	Willow Slough .....	381
LaBelle .....	20	Withers .....	3787
Lochridge .....	2575		

It is Further Ordered that allowable oil in the foregoing Order is measured on 100 per cent tank tables according to the Pipe Line Rule Number Nine (9), and corrected to sixty (60) degrees Fahrenheit.

It is Further Ordered that this Cause be held open on the Docket for such further orders as may be necessary and supported by evidence of record in the above Cause.

**RAILROAD COMMISSION OF  
TEXAS,**

C. V. TERRELL, Chairman,  
ERNEST O. THOMPSON,  
Commissioner.

(Seal)

Attest:

C. F. PETET, Secretary.

## EXHIBIT 17.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket No. 120. .

In re: Conservation and Prevention of Waste of Crude  
Oil and Natural Gas in the East Texas Field.

Austin, Texas, May 29, 1934.

Pursuant to notice and hearing in the adoption and amendment of rules and regulations by the Railroad Commission of Texas governing the conservation of crude oil and natural gas and the prevention of waste thereof, and in the light of evidence heretofore introduced at hearings held pursuant to such notices:

It is Hereby Ordered by the Railroad Commission of Texas that Rule No. 1 of Sub-division II (Drilling) of Division 3, being special rules governing the East Texas Field, is hereby amended so as hereafter to read  
866 as follows:

Rule 1. Spacing Rule. No well for oil or gas shall hereafter be drilled in said East Texas Field nearer than 660 feet to any other completed or drilling well on the same or adjacent tract or farm; and no well shall be drilled in said field nearer than 330 feet to any property line, lease line or subdivision line; provided that the Commission in order to prevent waste, or to prevent the confiscation of property will grant exceptions to permit drilling within shorter distances than above prescribed whenever the Commission shall determine that such exceptions are necessary either to prevent waste or to prevent the confiscation of property. When an exception to such rule

is desired application therefor shall be filed with the Commission fully stating the facts, which application shall be accompanied by a plat drawn to the scale of one inch equalling four hundred feet, accurately showing to scale the property on which permit is sought to drill a well under an exception to this rule, and accurately showing to scale all other completed, drilling, and permitted wells on said property; and accurately showing to scale all adjacent surrounding properties and wells. Such application shall be verified by some person acquainted with the facts, stating that all facts therein stated are within the knowledge of the affiant true, and that the accompanying plat is accurately drawn to scale and correctly reflects all pertinent and required data. Such exception shall be granted only after at least ten days notice to all adjacent lessees affected thereby has been given, and after public hearing at which all interested parties may appear and be heard, and after the Commission has determined that an excep-

tion to such rule is necessary either to prevent  
 867 waste or to protect the property belonging to applicant from confiscation. All pending applications shall be amended to conform to this rule before being acted upon.

No well drilled in violation of this rule without special permit obtained in the manner prescribed in said rule, and no well drilled under such a special permit which does not conform in all respects to the terms of such permit, shall be permitted to produce either oil or gas; and any such well so drilled in violation of said rule or in violation of a permit granted as a special exception to said rule shall be plugged.

The order entered by this Commission on August 30, 1933, commonly designated as the direct and equidistant offset order is hereby rescinded, annulled and shall be of

no further force and effect. All other rules, regulations and orders of this Commission which conflict with the terms and provisions of Rule No. 1 as hereby amended and promulgated are hereby declared to have no further application to wells in said East Texas Field to the extent of such conflict.

In the adoption and promulgation of this order it is hereby declared that the Commission intends to adopt each phrase, sentence, and paragraph separately and independently of each other such phrase, sentence, and paragraph, and if any portion of this order or any portion of the rule hereby adopted shall be declared invalid, such declaration and such invalidity shall not affect any other portion.

RAILROAD COMMISSION OF  
TEXAS,

By LON A. SMITH,  
Chairman,

C. V. TERRELL,  
Commissioner,

ERNEST O. THOMPSON,  
Commissioner.

Attest:

C. F. PETET,  
Secretary.

(Seal)

## EXHIBIT 18.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket No. 120.

Austin, Texas, April 22, 1933.

In Re: Soncervation and Prevention of Waste of Crude Oil  
and Natural Gas in the East Texas Field:-

Special Order Promulgating Certain Rules and Regulations for the East Texas Field and Allocating to the Various Wells Therein the Maximum Amount of Oil to be Produced From Such Field:

Whereas, on the 3rd day of April, 1933, the Railroad Commission of Texas, hereinafter called Commission, held a hearing at Austin, Texas, for the purpose of determining what rules and or orders should be promulgated for the purpose of preventing, insofar as possible, waste of oil, gas, gas energy and other propulsive forces tending to aid in the extraction of oil and other natural resources of the State of Texas existing in the oil and gas producing area in Rusk, Gregg, Smith, Upshur, and Cherokee Counties, Texas, or extensions of such area, wherever located; and

Whereas, The Commission has deemed it necessary and advisable to consider and determine the actual and comparative productive capacity of each of the more than ten thousand oil and gas wells in said counties above mentioned, the oil producing area therein constituting what is commonly known and referred to as the East Texas Oil Field; and

Whereas, the Commission has tested or caused to be tested under its supervision, a sufficient number of "key wells" in said field to determine the facts mentioned in the last preceding paragraph, as well as other pertinent facts; and

Whereas, the Commission has not had sufficient time since the hearing above mentioned and since the making of the tests above mentioned to completely and thoroughly compile, study, analyze and assimilate the testimony adduced at the hearing, and the facts, data, and information obtained as the result of the making of the "key well" tests above mentioned; and

Whereas, the Commission deemed it necessary and for the best interests of the State and its citizenship and the various persons interested, directly or indirectly, in the production of oil in the East Texas Field that waste of the natural resources therein be prevented so far as possible, and for the purpose of permitting speedy elimination of such waste as might result from or occur despite the entry of this order, and in order that the Commission may make an adjustment of any discriminations and injustices arising or tending to arise under this order, and for the purpose of rechecking and, if necessary, reconsidering and correcting any errors, either of figures or judgment and discretion, the Commission makes, and enters the following temporary order, to become effective at 7 o'clock, A. M., Central Standard Time, April 24, 1933, and to continue in full force and effect until 7 o'clock, A. M., Central Standard Time, May 10, 1933, unless sooner vacated, changed, modified or amended, to-wit:

1. The Commission finds that the average hourly oil production capacity in barrels of 42 gallons each of each



well in said East Texas Field average over a period of twenty-four hours is as set out in the schedule hereto attached, marked Exhibit "A" and made a part hereof to the same extent and effect as if copied in full as the next succeeding paragraph hereof.

2. It is ordered that during each twenty-four hour period following 7 A. M. Central Standard Time, April 24, 1933, the owner or operator or manager of each well listed and set out in Exhibit "A" shall be permitted, either collectively or individually, to produce from such  
870 well a maximum of 15% of its average potential producing capacity as determined by the Commission and set forth in Exhibit "A." In no event shall any well in said area produce during the first twenty-four hours period above mentioned, or any successive twenty-four hour period, more than said 15% of its average hourly potential producing capacity.

3. The purpose of the Commission is to adopt and enforce a conservation order fair and equitable in its operation and to that end to provide such a method of allocating the production in the field as will recognize and give effect to the distinctive characteristics of the various wells in the field, so far as can be done. The Commission recognizes the difficulty of such task and that it is difficult, if not impracticable, to lay down in advance a general, inflexible rule governing the method of allocating the allowable that will in all cases give proper effect to actual differences in the productive capacity of different parts of the field and the various wells therein. Accordingly, as a part of the method of effecting the distribution of the Allowable, and for the purpose of and with the intent to make the distribution fair and equitable, it is provided, and the Commission hereby declares such to be its intent and desire, that the Supervisor in charge of said field, upon written application made by the owner or operator



or manager of any well or wells, or the duly authorized agent of either, may grant exception or exceptions to the order where such is necessary to do equity and prevent arbitrary and or unreasonable discrimination as between different wells in the field. No exception, however, shall be granted except upon written application to the Commission supported by the affidavit of one or more of the parties above mentioned, detailing the existence of all facts upon which the exception should be based and expressly affirming the bona fide belief on the part of the affiant that such facts exist; such exception or exceptions shall not take effect until approved by the Commission. The affidavit or affidavits above mentioned shall not be conclusive as to the existence of any or all of the facts therein detailed and the Commission shall be permitted to do any and all things reasonably necessary to affirmatively establish or refute the existence of such facts, and no exception shall be granted until and unless the Commission shall determine that the method of allocating the allowable does not give proper effect to actual differences in the productive capacity of the various wells; that is to say, no exception shall be granted except to better carry out the general purpose of the order, which is to conserve the natural resources existing in the East Texas Oil Field without discriminating against any one or more wells in the field in favor of any one or more wells in the field, but on the contrary to give proper recognition to actual differences in the productive capacity of each well in said field.

4. For the purpose of making necessary adjustments, if any, to eliminate arbitrary and unreasonable discrimination, the Commission hereby declares that upon proof that the finding of the average hourly potential of any well or wells in said field is erroneous to the extent of causing or tending to cause arbitrary and unreasonable discrimination, such orders will be entered as will eliminate such

discrimination; and in the event of the filing of application for exceptions as hereinabove provided and an adverse ruling thereon by the Commission and any Court of competent jurisdiction should thereafter, by final decree hold that the Commission erred in such ruling, the

Commission will readily enter its order and do  
 872 such other things in accordance with the mandate of such Court as are necessary to eliminate such discrimination.

5. It is further declared to be the intent and purpose of the Commission to consider each well in the field separately and individually and permit, without the necessity of changing this order as a whole, by such orders as may be necessary, the production from such well; of sufficient oil to recognize and give effect to the actual difference in the productive capacity of such well as compared to any other well or wells in the field.

Done at the City of Austin, this 22nd day of April, A. D. 1933.

RAILROAD COMMISSION OF  
 TEXAS

By LON A. SMITH, Chairman.

C. V. TERRELL,

Commissioner.

(Seal)

ERNEST O. THOMPSON,

Commissioner.

Attest:

C. F. PETET, Secretary.

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## EXHIBIT 36.

Railroad Commission of Texas.

Oil and Gas Division.

Engineering Department.

Schedule Showing Irregular Levels at Which Woodbine  
Water is Produced in the East Texas Field.

Total Depth From To	No. of Wells	Percent of Total Wells	Cumulative Per Cent	Wells
3266 3270	41	1.35	1.35	41
3271 3275	39	1.28	2.64	80
3276 3280	67	2.21	4.84	141
3281 3285	97	3.19	8.04	244
3286 3290	158	5.20	13.23	402
3291 3295	174	5.73	18.97	576
3296 3300	232	7.64	26.61	808
3301 3305	380	11.49	39.13	1188
3306 3310	422	13.90	53.03	1610
3311 3315	536	17.66	70.69	2146
3316 3320	409	13.47	84.16	2555
<hr/>				
3321 3325	239	7.87	92.03	2794
3326 3330	146	4.81	96.83	2940
3331 3335	63	2.08	98.91	3003
3336 3340	33	1.09	100.00	3036

Total wells producing Woodbine water shown on  
Railroad Commission water report as of  
October 1, 1938 ..... 3746  
Total number of wells included in this report... 3036

Total wells not bracketed because of inadequate  
information (Some operators not knowing  
total depths of the older wells, and not hav-  
ing corrected elevations) ..... 710

Total wells producing Woodbine water above .....	3320—2555	=	84.16%
Total wells producing Woodbine water below .....	3320— 481	=	15.84%
	3036	=	100.00%

The data for this report was obtained, compiled and computed from the total depths of wells making two per cent or more of Woodbine water as reported and sworn to by the operators in the East Texas Field.

ALBERT S. TRUBE,

Petroleum Engineer.

# EXHIBIT 37.

Mr. Rowan Claimed:	Per acre Foot
	Original 60,000 bbls. Now 46,000 bbls.

	At Fort Worth	Before Commission	Yesterday
Estimate of per-acre foot recoverable oil originally	45,000 (1933)	70,000 (1938)	60,000 (1939)
Percentage Inc. Over original Est.		55.5%	33.3%
Recoverable Oil for 24.99 Ac. Various Estimates	1,124,550 (14,332 pr. ac.)	1,749,300 (14,332 pr. ac.)	1,499,400 (14,332 per ac.)
Production to Jan. 1, 1939	358,159	358,159	358,159
This remaining According to Rowan's est.	766,391	1,391,141	1,141,241

Explain exponents of expansibility of East Texas crude, then show that he has as much recoverable oil as he originally had, less that lost by expansion: (Expansion factor for 500± drop):

	At Fort Worth	Before Commission	Yesterday
Est. Recoverable Oil ..	1,124,550	1,749,300	1,499,400
Factor 500± .....	.0046	.0046	.0046
Loss by Expansion ...	5,172	8,047	6,897
Has Produced .....	358,159	358,159	358,159
Loss by Expansion ...	5,172	8,047	6,897
Gain by Drainage ....	353,987	350,112	351,262

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## EXHIBIT 41.

Table Showing Estimate Rate of Abandonment of Oil Wells in East Texas Oil Field and Its Effect Upon Field Allowable Production.

Prior to 1935	20	Cumulative end of Year	Daily Allowable 20 Bbls. each
1935	3	23	460
1936	21	44	880
1937	73	117	2,340
1938	207	324	6,480
Estimated			
1939	250	574	11,480
1940	300	874	17,480
1941	340	1214	24,280

Estimated		Cumulative end of Year	Daily Allowable 20 Bbls. each
1942	390	1604	32,080
1943	425	2029	40,580
1944	470	2499	49,980
1945	520	3019	60,380
1946	560	3579	71,580
1947	600	4179	83,580
1948	650	4829	96,580
1949	700	5529	110,580

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## EXHIBIT 42.

## Density Data.

	No. Wells	Acres	Density (Acres per well)
1st Mile East .....	128	640	5
2nd Mile East .....	160	640	4
3rd Mile East .....	124	640	5.12
4th Mile East .....	34	160	4.70
Totals .....	446	2080	4.66
8 times folded .....	47	200	4.25
8 times circular .....	44	200	4.55
1 $\frac{1}{2}$ mile circular .....	106	502.6	4.51
3 $\frac{1}{4}$ mile circular .....	246	1130.9	4.49
1 mile circular .....	444	2010.6	4.53

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EXHIBIT No. 43—Order of R. R. Commission, dated 4 22 33 promulgating certain Rules and Regulations for the East Texas Field and allocating to the various wells therein the Maximum amount of Oil, etc., (same as Exhibit No. 18) omitted from the printed record, being heretofore copied at page 899.



## EXHIBIT 44.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket No. 120.

In Re: Conservation and Prevention of Waste of Crude Petroleum Oil and Natural Gas in the East Texas Field.

Austin, Texas, January 31, 1933.

Supplemental Order Amending Special Order Fixing Rules and Regulations for the Prevention of Physical Waste of Crude Petroleum Oil and Natural Gas in What is Known as the East Texas Field Composed of Upshur, Smith, Rusk, Gregg and Cherokee Counties, Texas.

Whereas, the Railroad Commission of Texas, on February 25, 1932, adopted an order promulgating rules and regulations for the prevention of physical waste of crude petroleum oil and natural gas in what is known as the East Texas field composed of Upshur, Smith, Rusk, Gregg, and Cherokee Counties, Texas, and among other rules adopted for that purpose was the amendment of Rule 37 limiting the spacing of wells in said field, which amendment has been continuously kept in effect by subsequent orders; and

Whereas, it appears to said Commission that from evidence adduced at the East Texas hearing held in Austin, December 28 to 31, 1932, inclusive, said rule should be further amended, in order that properties might be more fully developed so as to insure a maximum oil recovery:

Therefore, it is hereby Ordered by the Railroad Commission of Texas that, effective as of the date hereof, Rule 1, Section (a) of said order of February 25, 1932, relating to the modification of Rule 37 be and the same is hereby amended so as to hereafter read as follows:

884        Rule 1: (a) Rule 37, adopted November 26, 1919, is hereby amended insofar as it applies to the East Texas Field so as to hereafter read as follows: "No well shall hereafter be drilled for oil or gas at any point less than six hundred and sixty (660) feet from any drilling or completed well; and no well shall hereafter be drilled for oil or gas at any point less than three hundred and thirty (330) feet from any property or division line; provided, however, the Commission in order to prevent waste or to protect vested rights, will, after hearing, grant exceptions permitting drilling within a less or shorter distance than hereinabove prescribed, upon application duly filed fully stating the facts, notice of such application and hearing having been first given to all adjacent lessees affected thereby; provided, that if all adjacent lessees affected thereby waive in writing, notice of hearing on or objection to the granting of said application, the Commission may proceed to determine such application without hearing; and, provided further that in cases of forced offsets the Commission may grant exceptions without waivers or hearing when it is evident that the wells desired are necessary to protect the properties on which it is proposed to drill them."

Section (b) and (c) of said order of February 25, 1932, and any or all other orders relating to spacing of wells on twenty (20) acre units and fractional units in said East Texas Field are hereby canceled.

RAILROAD COMMISSION OF  
TEXAS,

By LON A. SMITH,

Chairman,

C. V. TERRELL,

Commissioner,

ERNEST O. THOMPSON,

Commissioner.

Attest:

C. F. PETET,

Secretary.

(Seal)

885

EXHIBIT 45.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Dockets Nos. 108, 120, 123, 124, 125, 126,  
128, 129, 132 and 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Austin, Texas, September 27, 1935:

Special Rules Governing the East Texas Field.

The following rules shall govern the present producing areas and extensions thereof in the Counties of Gregg, Upshur, Smith, Eastern Cherokee, and Rusk,

Texas, which shall constitute and be known as the East Texas Field.

No variation from or exception to the provisions of this order shall be permitted or valid unless given in writing by the Railroad Commission of Texas or its Agent in charge of the enforcement of its orders in said field.

Rule 22, under Division 3, Special Rules governing the East Texas Field of the General Rules and Regulations of October 17, 1933;

Open flow tests have been and will be hereafter made according to the following plan:

A. All wells heretofore designated and used as key wells for the basing of potentials on all wells in the East Texas Field shall be re-tested, and or any additional wells requested by any operator of said well. The initial test on these key wells shall be equipped and tested on or before October 15, 1935.

886 B. All mechanical operations for test of each well except gauging for the purpose of determining the amount of oil produced from each well so tested, shall be carried out by the owner, operator or the duly authorized agent of either, but shall be under the supervision of the Engineering Department of the Railroad Commission of Texas and such tests shall be made according to the following schedule or plan:

The officer or Agent of the Commission in charge of said field shall assign sufficient inspectors to each district to supervise all tests as required. The test of any well may be witnessed by the owner, operator or manager of any well in the section in which is located such

well as is being tested, and/or the owner, operator or manager of any well in a section contiguous to the section on which is located such well as is being tested or the duly authorized agent or representative of either, and for such purpose such owner, operator or manager or the duly authorized agent or representative thereof shall have the right of ingress and egress to the well being tested.

C. All wells selected as test wells shall be as nearly as practicably possible be made to conform to the following specifications as to equipment, to-wit:

Flow lines shall be sufficient to carry the open flow of the well through casing and tubing and in no event shall be more than four inches in diameter and shall not be more or less than three in number. Wells shall be flowed direct into tanks and every precaution must be taken during the test to eliminate the hazard of fire and or explosion.

D. Each test shall be tested two hours by flowing naturally through casing and tubing and no test will be considered that does not flow the full required  
887 time specified in this order. The potential allocated will be the average hourly flow for the two hour period.

E. The owner, manager or operator of each test well and the Agent, deputy or employee of the Commission supervising the test on the particular well shall make a joint report of such test and certify to the correctness thereof, said report to be made as hereafter provided on the proper form which form shall contain the following information, to-wit:

1. A legal description of the lease on which such test well is located.

2. The number of the well, the test of which is being reported.

3. The record of bottom and top gauges required in Paragraph 7 hereof.

4. A mathematical calculation as to the number of barrels of marketable oil which is run into the tank or tanks during the two hour period herein described. The term "marketable oil" means any crude petroleum adopted for refining or fuel properly settled and containing not more than 2% basis sediment, water or other impurities above a point six (6) inches below the pipe line connection with the tank.

5. The name, and if known to the person making the report, the post office address or addresses of the owner and or owners of the lease on which such test well is located.

6. If known to the person making the report, the name and post office address or addresses of the owner or owners of the fee title to the land on which such well is located.

7. The Central Standard Time at which such well was opened for test.

8. The Central Standard Time at which such well was shut in.

9. No test shall begin earlier than seven (7) a. m. and all tests must be completed by seven (7) p. m. Central Standard Time.

888 10. The size of tubing and of flow string of casing with which such well was equipped at the time of and during such test.

11. The size and length of flow lines.
12. The closed in tubing and casing pressure before and after the test prescribed herein and the flowing pressure.

F. A settled bottom gauge shall be taken on tank or tanks in which well is being tested before test is started. Each tank shall be allowed to stand fifteen (15) minutes after the sixty (60) minute flow before taking top gauge. Gauge shall be reported to the nearest quarter inch. Not more than one well shall be tested in the same tank at the same time and no test well shall be flowed into any one tank for more than sixty (60) minute period hereinabove mentioned.

G. The oil produced from each well during the test prescribed herein shall be charged against the future allowable production of the owner, manager or operator whose well is being tested. Production in excess of the daily allowable obtained by taking potentials will be made up ratably during the test. Where the Commission requests an operator to test wells in order to prove the producing conditions of a local area, which will include all wells that are being retested during the period between September 25th and October 15th, 1935, shall be given one-half (1/2) of the total amount of oil produced on the two (2) hour test to compensate for the expense of making such test. This oil shall be tendered and not charged against the future allowable for the well tested. This does not mean that the Commission will defray either part or all of the expense of future wells which will be tested where the operators request such tests; in other words, after October 15th, 1935, no well will be given oil to help defray the expense of taking potential tests.



H. Any operator who can show just cause for the taking of a potential test of his well shall make application for same within the first three days after the first of each calendar month and if application for such is granted, by the Commission, such test well shall be made before the 15th of such month and no correction on the schedule shall be made until the next effective schedule date.

RAILROAD COMMISSION OF  
TEXAS,

ERNEST O. THOMPSON,

Chairman,

C. V. TERRELL,

Commissioner,

LON A. SMITH,

Commissioner.

(Seal)

Attest:

C. F. PETET,

Secretary.

EXHIBIT 46.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Dockets Nos. 108, 120, 123, 124, 125, 126,  
128, 129, 132 and 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Austin, Texas, December 6, 1935.

Special Rules Governing the East Texas Field.

The following rules shall govern the present producing areas and extensions thereof in the Counties of Gregg,

890 Upshur, Smith, Eastern Cherokee, and Rusk in the State of Texas, which shall constitute and be known as the East Texas Field.

No variation from or exception to the provisions of this Order shall be permitted or valid unless given in writing by the Railroad Commission of Texas or its agent in charge of the enforcement of its orders in said field.

Rule 22, under Division 3, Special Rules governing the East Texas Field of the General Rules and regulations of October 17, 1933;

Open flow tests have been and will be hereafter made according to the following plan:

A. All wells heretofore designated and used as key wells for the basing of potentials on all wells in the East Texas Field shall be retested, and or any additional wells requested by any operator of said well. The initial test on these key wells shall be equipped and tested on or before January 12, 1935.

B. All mechanical operations for test of each well except gauging for the purpose of determining the amount of oil produced from each well so tested, shall be carried out by the owner, operator or the duly authorized agent of either, but shall be under the supervision of the Engineering Department of the Railroad Commission of Texas, and such tests shall be made according to the following schedule or plan:

The officer or agent of the Commission in charge of said field shall assign sufficient inspectors to each district to supervise all tests as required. The test of any well may be witnessed by the owner, operator or man-

ager of any well in the Section in which is located such well as is being tested, and or the owner, operator or manager of any well in a Section contiguous to the section on which is located such well as is being tested or the duly authorized agent or representative of either, and for such purpose such owner, operator or manager or the duly authorized agent or representative thereof shall have the right of ingress and egress to the well being tested.

C. All wells selected as test wells shall be as nearly as practicably possible made to conform to the following specifications as to equipment, to-wit:

Flow lines shall be sufficient to carry the open flow of the well through casing and tubing and in no event shall be more than four inches in diameter and shall not be more or less than three in number. Wells shall be flowed direct into tanks, and every precaution must be taken during the test to eliminate the hazard of fire and or explosion.

D. Each test shall be tested two hours by flowing naturally through not more or less than 7" O. D. casing and not more than 2 1/2" tubing and no test will be considered that does not flow the full required time specified in this order. The potential allocated will be the average hourly flow for the two hour period.

E. The owner, manager or operator of each test well and the agent, deputy or employee of the Commission supervising the test on the particular well, shall make a joint report of such test and certify to the correctness thereof, said report to be made as hereafter provided on the proper form which form shall contain the following information, to-wit:

1. A legal description of the lease on which test well is located.

892 2. The number of the well, the test of which is being reported.

3. The record of bottom and top gauges required in Paragraph 7 hereof.

4. A mathematical calculation as to the number of barrels of marketable oil which is run into the tank or tanks during the two hour period herein described. The term "marketable oil" means any crude petroleum adapted for refining or fuel properly settled and containing not more than 2% basic sediment, water or other impurities above a point six (6) inches below the pipe line connection with the tank.

5. The name, and if known to the person making the report, the post office address or addresses of the owner and or owners of the lease on which such test well is located.

6. If known to the person making the report, the name and post office address or addresses of the owner or owners of the fee title to the land on which such well is located.

7. The Central Standard Time at which such well was opened for test.

8. The Central Standard Time at which such well was shut in.

9. No test shall begin earlier than seven (7) a. m., and all tests must be completed by seven (7) p. m., Central Standard Time.

893 10. The size of tubing and of flow string of casing with which such well was equipped at the time of and during such test.

11. The size and length of flow lines.

12. The closed-in tubing and casing pressure before and after the test prescribed herein and the flowing pressure.

F. A settled bottom gauge shall be taken on tank or tanks in which well is being tested before test is started. Each tank shall be allowed to stand fifteen (15) minutes after the sixty (60) minute flow before taking top gauge. Gauge shall be reported to the nearest quarter inch. Not more than one well shall be tested in the same tank at the same time and no test well shall be flowed into any one tank for more than sixty (60) minute periods hereinabove mentioned.

G. The oil produced from each well during the test prescribed herein shall be charged against the future allowable production of the owner, manager, or operator whose well is being tested. Production in excess of the daily allowable, obtained by taking potentials, shall be made up ratably during the test. Where the Commission requests an operator to test wells in order to prove the producing conditions of a local area, and in order to properly complete its potential map, which will include all wells that are being retested during the period between December 6, 1935, and January 12, 1936, shall be given one-half (1/2) of the total amount of oil produced on the two (2) hour test to compensate for the expense of making such test.

894 In instances where the value of one-half (1/2) of the total volume of oil produced does not compensate the operator for the cost of taking said potential test the Commission will allow sufficient oil to

be produced above the prevailing daily allowable to equal the expense incurred in making said test. In no event shall the expenses incurred include purchase of material, but shall cover only the cost of services rendered and rental of equipment. The operator in applying for oil to cover cost of making test shall submit to the Commission's Engineering Department at Kilgore an itemized and sworn statement of cost which must be acceptable to said Commission's representative before authority for oil in excess of the daily allowable will be granted.

This oil shall be tendered and not charged against the future allowable for the well tested. This does not mean that the Commission will defray either part or all of the expense of future wells which will be tested where the operators request such tests; in other words, after January 12, 1936, no well will be given oil to help defray the expense of taking potential tests.

H. Any operator who can show just cause for the taking of a potential test on his well after February 1, 1936, shall make application for same within the first three (3) days after the first of each calendar month and if application for such is granted, by the Commission, such test shall be made before the 12th of such month and no correction on the schedule shall be made until the next effective schedule date.

RAILROAD COMMISSION OF  
TEXAS.

ERNEST O. THOMPSON,  
Chairman.

C. V. TERRELL,  
Commissioner,

L. A. SMITH,  
Commissioner.

(Seal)

Attest:

C. F. PETET,  
Secretary.

895

## EXHIBIT No. 47.

## Railroad Commission of Texas.

## Oil and Gas Division.

Oil and Gas Dockets Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 & 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Austin, Texas, August 26, 1935.

Special Order Fixing Allowable Production of Crude Oil  
in the Various Fields and Districts in Texas.

Whereas, after due notice hearings have been held at Austin, Texas, at various times, including hearing on August 19, 1935, with respect to the existence and imminence of waste of oil and gas in the State of Texas, and the prevention thereof; and

Whereas, in view of the evidence, including among other matters the physical conditions in the various fields, the transportation and marketing facilities, the reasonable market demand, the reasonableness of the allocation as between fields of the allowable production under previous orders; and

Whereas, the Railroad Commission of Texas finds from the evidence that the reasonable market demand for oil produced in this State from the various fields and districts therein equals the amount hereinafter shown as the allowable production thereof during the period beginning at 7 o'clock a. m. September 1, 1935, and ending at 7 o'clock a. m., October 1, 1935; and



Whereas, the Railroad Commission of Texas finds that waste exists or is imminent and that to prevent such waste of oil and gas, as the same is defined by the applicable Statutes, it is necessary to restrict the  
896 production of oil in the State of Texas as provided for herein;

Whereas, at the hearing of the Railroad Commission of Texas on August 19th, 20th, 26th and 27th, 1935, the Railroad Commission of Texas heard at great length the proposal as outlined by the witness F. E. Heath, who testified on behalf of the Humble Oil & Refining Company, The Texas Company, the Shell Company, the Sun Oil Company, the Tidewater Company, Magnolia Petroleum Company and the Amerada Company, whose formula would put the East Texas field on a plan of acreage proration, which plan was acreage times potential with a ten acre spacing rule, which works out as follows:

Under certain conditions, the owner of a ten acre tract in the East Texas field with one well on this tract would be allowed 29 barrels of allowable production of petroleum each day, and the owner of a tract of one acre with one well on it, under the same conditions, would be allowed to produce 2.9 barrels of oil per day. This plan was later extended by the proponents to the extent that it was recommended that the Commission make exceptions so that the man with a well on one acre would be allowed substantially eight barrels of oil per day or enough oil to bring \$8.00 per day, or some such amount, in the discretion of the Commission, which would allow the small operator to make a profit out of his operation.

The Commission, after an exhaustive hearing on this matter, finds that the present method of proration in effect in the East Texas field at this time, which is to allow the well to produce that amount below set out, which is

three per cent of the average hourly potential  
 897 producing capacity of each well, as determined  
 by the Commission, is the fairest method possible.

The Commission further finds that this method of pro-  
 ration prevents waste, conserves the oil and gas within  
 the East Texas field, and does not result in injury to any  
 lease operator or owner in said field.

In the recent case of Brown v. Humble Oil & Refining  
 Company, the Supreme Court announced certain rules for  
 our guidance in enforcing the provisions of Rule 37. We  
 recognize the authority of that Court to construe the laws  
 under which we function, as well as its authority to review  
 orders pursuant to statute or under the circumstances out-  
 lined in that opinion; and it is not only our duty but our  
 desire and intention to comply with its decrees. However,  
 in this instance, the importance of its decision to this  
 body, the public and the industry is so great that we must  
 undertake to be certain, both of our understanding of the  
 scope of the judgment and of its finality.

As an administrative body, our temporary difficulty  
 arises out of certain expressions in the opinion, founded  
 on fact issues, which are not consonant with the evidence  
 presented to this Commission over a period of years on the  
 same essential facts as presented at this and prior hearings  
 held by this Commission. If such expressions are limited  
 to facts necessary to a decision of that case, they present  
 no confusion, but, if they are intended to form a rule of  
 property for our guidance in all cases, then it appears to  
 us that the importance of the question merits clarification.

In the opinion referred to, the Court observes, "It is  
 now, however, recognized that when an oil field  
 898 has been fairly tested and developed, experts can  
 determine approximately the amount of oil and

gas in place in a common pool, and can, also, equitably determine the amount of oil and gas recoverable by the owner of each tract of land under certain operating conditions."

Based upon this finding, the Court then defines our duties in the following language, in part:

"Also conditions may arise where it would be proper, right and just to permit tracts to be subdivided, and such subdivisions drilled after the adoption of the rule; but in all such instances it is the duty of the Commission to adjust the allowable, based upon the potential production, so as to give the owner of such smaller tract only his just proportion of the oil and gas. By this method each person will be entitled to recover a quantity of ~~oil~~ and gas substantially equivalent in amount to the recoverable oil and gas under his land."

Our uncertainty arises out of the fact that, in the exercise of our duties at hearings held over a number of years, a substantially preponderant majority of the expert witnesses have testified under oath to facts which do not harmonize with but contradict the statement that "when an oil field has been fairly tested and developed, experts can determine approximately the amount of oil and gas in place in a common pool and can, also, equitably determine the amount of oil and gas recoverable by the owner of each tract of land under certain operating conditions." In fact, the testimony we have heard at this and other hearings held in the past is to the effect that surface

ownership has no true relation to the oil and gas reserves which may underlie the particular surface, and that sufficient information is not available in the state of engineering science today to determine with that degree of exactitude indicated by the quotation from the opinion the amount of oil and gas in place in

a common pool, and . . . to equitably determine the amount of oil and gas recoverable by the owner of each tract under certain operating conditions.

We further find from the evidence the more wells that are drilled the greater will be the ultimate recovery of oil and gas from any given pool.

The hearing just closed raises grave doubts as to the wisdom or value of any Rule 37 in preventing waste or in aid of the recovery of oil, except in the instances of certain new fields and then only as a prevention of fire hazards and blowout dangers.

Now, Therefore, in order to prevent the waste of oil and gas in the State of Texas, which will take place by authorizing production over the said period in excess of the reasonable market demand;

It is Hereby Ordered that beginning at 7 o'clock a. m., Sunday, September 1, 1935, and continuing to October 1, 1935, unless other periods are prescribed herein, the production of oil in the State of Texas, and the various fields therein, until further ordered, shall not exceed the amounts hereinafter shown as the allowable production thereof, and in order to adjust the current allowable production of crude oil in Texas, as nearly as may be, to the demand as shown, the allowable daily production of the various fields and districts in said State shall be limited to the amounts hereinafter specified and the following orders fixing such limitation on production in the various fields and districts are hereby adopted.

1. Rule 2 of Division 2 as contained in an order of this Commission dated October 17, 1933, pertaining to the Panhandle District of Texas is hereby readopted and amended as follows:

Rule 2. Not more than fifty-two thousand eight hundred (52,800) barrels of crude oil shall be produced from said district during any day of the effective period of this order. Moore County shall not produce in excess of fifteen hundred (1500) barrels per day. Moore County allowable is additional to Panhandle allowable.

2. Rule 23 (a) of Division 3, as contained in an order of this Commission dated October 17, 1933, pertaining to the East Texas Field is hereby readopted and amended as follows:

Rule 23 (a). It is ordered that during each twenty-four (24) hour period beginning at 7 a. m., Central Standard Time, September 1, 1935, the owner or operator or manager of each well in the East Texas Field, shall be permitted, either collectively or individually, to produce daily from each well a maximum of Three (3%) per cent of its average hourly potential producing capacity as determined by the Commission.

3. Rule 2 of Division 5, as contained in an order of this Commission dated October 17, 1933, pertaining to the North Texas District is hereby readopted and amended as follows:

Rule 2. Not more than fifty-eight thousand five hundred (58,500) bbls. crude oil shall be produced from said district during any day of the effective period of this order. Foard County shall not produce in excess of eight hundred thirty-seven (837) barrels per day. Foard County allowable is additional to North Texas allowable.

4. Rule 2 of Division 6, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than forty nine thousand one hundred ninety five (49,195) barrels of crude oil shall be produced from said District during any day of the effective period of this order, which is distributed to the various counties as follows:

Brown	2006	McCullough	1
Callahan	1631	Palo Pinto	447
Coleman	1310	Reagan (Big Lake)	9800
Comanche	84	Reagan (Grayson)	180
Crockett (Todd)	10	Shackelford	5873
Crockett (World)	835	Stephens	5080
Eastland	3191	Throckmorton	483
Erath	113	Taylor	130
Fisher	5331	Upton (McCamey)	5920
Haskell	17	Young (S 2)	4079
Irion	56	Runnels	520
Jones	2098		

5. Rule 4 of Division 7, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Texas District is hereby readopted and amended as follows:

Rule 4. Not more than one hundred thirty thousand one hundred twenty (130,120) barrels of crude oil per day shall be produced from said District during any day of the effective period of this order, which shall be distributed to the various fields therein as follows:

Brown & Altman	212	Netterville	9
Church & Fields	5830	Monroe	25
Cowden, North	3270	Means	605
Cowden, South	580	Parker	119
Crane-Cowden	372	Pecos Valley	225
Crane-Waddell	313	Richards	12
Deep Rock	239	Halley	100



Edwards	4	Northwest	23
Ector-Harper	125	Scarbrough	23
Ector-Penn	5088	Sealey	66
Fuhrmans	900	Shipley	1580
Gulf-McElroy	3865	Taylor-Link	1165
Sayre	1650	Tobarg	1750
Hendricks	16150	Ward, North	5650
Howard-Glasscock	20000	Ward, South	9800
Iatan-East Howard	4000	Westbrook	919
Johnson	35	Walker	12
Keystone	350	White & Baker	2
Leck	500	Yates	39124
Loving (Wheat)	1986	Goldsmith	375
Masterson	250	Sand Hills	15
McClintic	500		

6. Rule 2 of Division 4, as contained in an Order of this Commission dated October 17, 1933, pertaining to the East Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than forty seven thousand eight hundred thirty six (47,836) barrels of crude oil per day shall be produced from said fields in said District during any day of the period of September 1, 1935, to October 1, 1935; said amounts shall be allocated to the various fields in the following amounts:

Boggy Creek	572	Rusk	450
Camp Hill	651	Richland	35
Cayuga	3720	Powell	2244
Curry	148	South Bosque	12
Corsicana	415	Van	35733
Long Lake	200	Van Shallow	215
Mexia	2145	Trinity	1174
Post Oak	2	Wortham	102
Pottsboro	6	Wortham Shallow	12



7. Rule 2 of Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Southwest Texas District is hereby readopted and amended as follows:

Rule 2. Not more than ninety five thousand nine hundred nine (95,909) barrels of crude oil shall be produced in said District during any day of the effective period of this order, and the same shall be distributed to all fields in said district as follows:

Division 1.

Alta Vista .....	5	Kimbro .....	22
Bateman .....	247	Larremore .....	40
Bob Rose .....	73	Lomo Alto .....	132
Buchanan .....	41	Lowe .....	1
Callahan .....	48	Luling-Branyon .....	5637
Carroll .....	84	Lytton-Springs .....	396
Cedar Creek .....	42	Manford .....	36
Cedar Creek (N) .....	200	Matthews .....	59
Chapman-Abbott .....	398	Meaders .....	6
Ghicon Lake .....	13	Minerva Rockdale .....	203
Clark .....	100	Noack .....	731
Cooksey .....	16	Pearsall .....	(shut in)
Darst Creek .....	8932	Schimmel-Batts .....	1
Dale .....	165	Somerset .....	733
Dunlap .....	15	Southton .....	72
Eckert .....	271	Taylor Ina .....	12
Espada Mission .....	1	Thrall .....	53
Gas Ridge .....	7	Salt Flat .....	4112
Hilbig .....	722	Von Ormy .....	39
Jones .....	1	Yoast .....	76
Jacobs .....	595		

## Division 2.

Caesar .....	950	Pettus. (New) .....	870
Coletta Creek .....	660	Port Lavaca .....	600
Dinero .....	240	Quintanna-O'Connor ..	1600
Dirks .....	1900	Ray .....	950
Greta .....	11830	Refugio (Dcep Sand) ..	195
Keeran .....	320	Refugio (New) .....	1305
McFadden .....	130	Refugio (Old) .....	2800
McNeil .....	500	Hords Creek .....	2
Mineral .....	10	Tuleta .....	2527
Mt. Lucas .....	210	Vanderbilt .....	100
Normanna .....	15	Worthington .....	200
O'Connor-McFadden ..	350	Mekeska .....	150
Placedo .....	470	Mauritz .....	150
Pettus .....	1661		

## Division 4.

Albercas .....	111	Laurel .....	95
Alworth .....	3	Loma Novia .....	2520
Angelita .....	3	Lopez .....	450
Aviators .....	409	Los Olmos .....	200
Barbacosa .....	38	Mercedes .....	150
Bruni .....	2975	Mirando City .....	389
Carolina-Tex .....	23	Mirando Valley .....	25
Charco Redondo .....	9	Moca .....	614
Cole East .....	37	O'Hern .....	920
Cole West .....	753	Piedras Pintas .....	45
Cuellar .....	113	Plymouth .....	1800
Driscoll .....	249	Premont Prospect .....	20
Eagle Hill .....	471	Randado .....	334
Escobas .....	1396	Rio Grande City .....	384
Government Wells		Roma .....	4
(N) .....	11233	Sinton .....	594
Government Wells		Seven Sisters .....	320
(S) .....	5789	S. R. C. ....	40

Guerra .....	372	White Point .....	38
Henne-Winch-Farris ..	26	Sam Fordyce .....	3126
Jennings .....	555	Sarnosa .....	940
Kingsville .....	61	Saxet (Old) .....	1262
Kohler .....	132	Saxet (New) .....	1849

8. Rule 2 of Section A, Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Gulf Coast District is hereby readopted and amended as follows:

Rule 2. Not more than one hundred forty seven thousand three hundred forty eight (147,348) barrels of crude oil per day shall be produced from said fields of said district during any day of the effective period of this order which shall be distributed to said fields as follows:

Allen Dome .....	5	Louise .....	1241
Anahuac .....	900	Livingston .....	2666
Ariola .....	1150	Manvel (Miocene) ..	4008
Bay City .....	35	Manvel (Oligocene) ..	3500
Big Creek .....	931	Markham .....	1349
Blue Ridge .....	1013	Mykawa .....	775
Boling .....	605	Mykawa (New) .....	2100
Brenham .....	6	Nash Dome .....	35
Brookshire .....	16	North Dayton .....	162
Buckeye .....	220	Old Ocean .....	200
Batson .....	690	Orchard .....	600
Batson (New) .....	621	Orange .....	741
Barbers Hill .....	17205	Pickett Ridge .....	150
Clay Creek .....	1079	Port Neches .....	1488
Cleveland .....	775	Pierce Junction .....	2790
Coproe .....	39,525	Pierce Junction (Vicks-	
Damon Mound .....	521	burg) .....	583
Dickinson .....	964	Raccoon Bend .....	2883
Esperson Dome .....	1200	Raccoon Bend (Cock-	
Fannett .....	694	field) .....	1581

Goose Creek .....	2857	Rockland .....	3
Gillock .....	(shut-in)	Saratoga .....	850
High Island .....	6170	Schwab .....	56
Hankamer .....	1858	Sugarland .....	5580
Hankamer (New) ..	350	Sour Lake .....	1755
Hardin .....	150	South Liberty .....	586
Hastings .....	1800	Spindletop .....	2597
Hull (Old) .....	3583	Thompson .....	10,737
Hull (New) .....	2961	Tomball .....	4,650
Humble .....	3255	West Columbia .....	2321
Lost Lake .....	230		

It is Further Ordered that allowable oil in the foregoing order is oil measured on 100 per cent tank tables according to the Pipe Line Rule Number Nine (9) and corrected to sixty (60) degrees Fahrenheit.

It is Further Ordered that this Cause be held open on the docket for such further orders as may be necessary and supported by evidence of record in above Cause.

RAILROAD COMMISSION OF  
TEXAS,

ERNEST O. THOMPSON,  
Chairman.

C. V. TERRELL,  
Commissioner.

LON A. SMITH,  
Commissioner.

(Seal)

Attest:

C. F. PETET, Secretary.

## EXHIBIT No. 48.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket Nos. 108, 120, 123, 124, 125, 126, 128,  
129, 132 & 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Austin, Texas, February 24, 1936.

Special Order Fixing the Allowable Production of Crude  
Oil in the Various Fields and Districts in Texas.

Whereas, after due notice hearings have been held at Austin, Texas, at various times, including hearing on February 18, 1936, with respect to the existence and imminence of waste of oil and gas in the State of Texas, and the prevention thereof; and

Whereas, in view of the evidence, including among other matters the physical conditions in the various fields, the transportation and marketing facilities, the reasonable market demand, the reasonableness of the allocation as between fields of the allowable production under previous orders; and

Whereas, the Railroad Commission of Texas finds from the evidence that the reasonable market demand for oil produced in this State from the various fields and districts therein equals the amount hereinafter shown as the allowable production thereof during the period beginning at 7 o'clock a. m., March 1, 1936, and ending at 7 o'clock a. m., April 1, 1936; and

Whereas, the Railroad Commission of Texas finds that waste exists or is imminent and that to prevent such waste of oil and gas, as the same is defined by the applicable Statutes, it is necessary to restrict the  
 908 production of oil in the State of Texas as provided for herein, and

Whereas, The Railroad Commission's Special Order Fixing Allowable Production of Crude Oil in the Various Fields and Districts in Texas, dated August 26, 1935, contains the following language:

"We further find from the evidence the more wells that are drilled the greater will be the ultimate recovery of oil and gas from any given pool."

By ~~this~~ language the Commission did not mean and did not find from the evidence that the closer wells are drilled the greater will be the ultimate recovery of oil and gas from any given pool, but by such language only meant and found from the evidence that the more wells that are drilled *in conformity with the spacing rules* as applicable to the various fields in Texas the greater will be the ultimate recovery of oil and/or gas from any given pool.

It was not then the intention and is not now the intention of the Railroad Commission to abrogate or abandon any of the spacing rules now in effect and applicable to the various oil and gas fields in Texas, nor to militate against the fact basis on which the Commission's spacing rules are based.

Now, Therefore, in order to prevent the waste of oil and gas in the State of Texas, which will take place by authorizing production over the said period in excess of the reasonable market demand;



It is Hereby Ordered that beginning at 7 o'clock a. m., Sunday, March 1, 1936, and continuing to April 1, 1936; unless other periods are prescribed herein, the production of oil in the State of Texas, and the various fields therein, until further ordered, shall not exceed the amounts hereinafter shown as the allowable production thereof, and in order to adjust the current allowable production of crude oil in Texas, as nearly as may be, to the demand as shown, the allowable daily production of the various fields and districts in said State shall be limited to the amounts hereinafter specified and the following orders fixing such limitation on production in the various fields and districts are hereby adopted.

1. Rule 2 of Division 2 as contained in an order of this Commission dated October 17, 1933, pertaining to the Panhandle District of Texas is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Eight Thousand and Eight Hundred (58,800) barrels of crude oil shall be produced from said district during any day of the effective period of this Order. Moore County shall not produce in excess of Fifteen Hundred (1500) barrels per day. Moore County allowable is additional to Panhandle allowable. The Osborne Area in Wheeler County shall not produce in excess of One Thousand (1,000) barrels per day. The Osborne Area allowable in addition to the Panhandle allowable.

2. Rule 23 (a) of Division 3, as contained in an order of this Commission dated October 16, 1933, pertaining to the East Texas Field is hereby readopted and amended as follows:

Rule 23 (a). Whereas, The Railroad Commission of Texas finds from evidence submitted to it at a hearing held in Austin, Texas, on February 18, 1936, and at pre-



vious hearings held before this regulatory body, that the reservoir of the East Texas Field has its energy supplied by a hydrostatic drive which encroaches from the west to the east, and only a certain amount of crude oil can be withdrawn daily from the East Texas reservoir in order to utilize to the greatest extent the energy necessary for the production and recovery of the greatest amount of oil ultimately from the reservoir. It has been recommended to the Commission by competent engineers that not more than 425,000 to 450,000 barrels of crude oil should be allowed to be produced from the East Texas reservoir in any one day in order that the reservoir might be depleted with the least amount of waste incurring. Evidence was also submitted to the Commission at these hearings that the production of from 425,000 to 450,000 barrels of crude oil will prohibit the coning of water; the uneven encroachment of water, and the subsequent trapping of much oil that otherwise, under higher daily allowables of crude oil, would not be recovered.

Therefore, it is Further Ordered by the Railroad Commission of Texas, that during each twenty-four (24) hour period beginning at 7 o'clock a. m., Central Standard Time, March 1, 1936, the owner or operator or manager of each well in the East Texas Field shall be permitted, either collectively or individually, to produce daily from each well a maximum of Two Point Eighty Five (2.85%) Per Cent of its average hourly potential producing capacity as determined by the Commission.

3. Rule 2 of Division 5, as contained in an order of this Commission dated October 17, 1933, pertaining to the North Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Eight Thousand Five Hundred (58,500) barrels of crude oil shall be produced from

said district during any day of the effective period of this order. Foard County shall not produce in excess of Five Hundred (500) Barrels Daily. Foard County allowable is additional to North Texas allowable.

4. Rule 2 of Division 5, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Thousand Six Hundred Fifteen (50,615) barrels of crude oil shall be produced from said District during any day of the effective period of this Order, which is distributed to the various counties as follows:

Brown	1761	McCullough	6
Callahan	1556	Palo Pinto	382
Coleman	1165	Reagan (Big Lake)	8020
Comanche	74	Reagan (Grayson)	172
Crockett (Todd)	10	Shackelford	6443
Crockett (World)	1060	Stephens	4691
Eastland	3060	Throckmorton	453
Erath	112	Taylor	129
Fisher	5423	Upton (McCamey)	7782
Haskell	18	Young South 2	4503
Irion	47	Runnels	370
Jones	3338	Webb-Ray	40

5. Rule 4 of Division 7, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Texas District is hereby readopted and amended as follows:

Rule 4. Not more than One Hundred Forty Seven Thousand Nine Hundred Sixty Five (147,965) barrels of crude oil, per day shall be produced from said District during

any day of the effective period of this Order, which shall be distributed to the various fields therein as follows:

Goldsmith	400	Netterville	15
Bashara	102	Monroe	25
Brown-Altman	371	Means	1185
Church-Fields	6960	Parker	50
Cowden, North	4350	Pecos Valley	372
Cowden, South	400	Penwell	6718
Crane-Cowden	572	Richards	10
Deep Rock	300	Snyder	-0-
Edwards	-0-	Northwest	28
Foster	100	Scarborough	1875
Fuhrmans	750	Sealey	535
Gulf-McClroy	4640	Shipley	1580
Sayre	3650	Taylor-Link	1350
Hendricks	14600	Tobarg	1825
Harper	96	Ward, North	12000
Halley	149	Ward, South	12245
Sand Hills	54	Westbrook	867
Howard-Glasscock	20000	Waddell	1528
Iaatan-E. Howard	4440	Walker	10
Johnson	30	Wheat	1850
Keystone	1168	White & Baker	3
Leck	500	Yates	38435
Masterson	211	Sand Hill (Ordovician)	150
McClintic	932	Emperor	415
McKinzie	10	Dobbs	100

6. Rule 2 of Division 4, as contained in an Order of this Commission dated October 17, 1933, pertaining to the East Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Thousand Two Hundred Twenty-Five (50,225) barrels of crude oil per day shall be produced from said fields in said District during any day

of the period of March 1, 1936, to April 1, 1936; said amounts shall be allocated to the various fields in the following amounts:

Bethany .....	16	Rusk .....	300
Boggy Creek .....	573	Richland .....	28
Camp Hill .....	675	Powell .....	2332
Cayuga .....	5104	Rodessa .....	500
Curry .....	131	South Bosque .....	11
Corsicana .....	434	Van .....	35733
Long Lake .....	750	Van Shallow .....	164
Mexia .....	2197	Trinity .....	1085
Post Oak .....	1	Wortham .....	95
Potter .....	70	Wortham (Shallow) ..	12
Pottsboro .....	4	East Freestone .....	10

7. Rule 2 of Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Southwest Texas District is hereby readopted and amended as follows:

Rule 2. Not more than One Hundred Thirty Two Thousand One Hundred Fifty Nine (132,159) barrels of crude oil shall be produced in said District during any day of the effective date of this Order, and same shall be distributed as follows:

#### Division I.

Alta Vista .....	5	Lowe .....	-0-
Bateman .....	206	Luling-Branyon .....	5550
Bob Rose .....	35	Lytton-Springs .....	377
Buchanan .....	41	Manford .....	30
Callahan .....	146	Matthews .....	51
Carroll .....	28	Meaders .....	-0-
Cedar Creek .....	52	Minerva Rockdale ..	220
Cedar Creek (N) ..	26	Noack .....	314

Chapman-Abbott	344	Pearsall	550
Chicon Lake	17	Schimmel-Batts	1
Clark	235	Somerset	700
Cooksey	13	Southton	67
Darst Creek	8968	Taylor <del>Isa</del>	7
Dale	160	Thrall	46
Dunlap	10	Salt Flat	4173
Eckert	276	Von Ormy	80
Espada Mission	1	Yoast	55
Gas Ridge	8	Larremore	48
Hilbig	791	Zoborski	10
Jones	-0-	Staples	3
Jacobs	595		
Kimbro			24,366
Kimbro (New)	47		
Loma Alto	80		

## Division II.

Caesar	1263	Port Lavaca	850
Coletta Creek	693	Quintanna-O'Connor	3000
Dinero	135	Ray	1781
Dirks	5040	Refugio (Deep Sand)	99
Greta	14930	Refugio (New)	2250
Greta Deep	1180	Refugio (Old)	2520
Keeran	300	Hords Creek	68
McFadden	32	Tuleta	1548
McNeil	175	Vanderbilt	10
Mineral	-0-	Worthington	76
Mt. Lucas	60	Fort Merrill	170
Normanna	12	Mauritz	150
O'Connor-McFadden	275	Whittington	1
Placedo	1902	Diamond Half	-0-
Pettus	1521		
Pettus (New)	1000		41,041

## Division IV.

Albercos .....	100	Lopez .....	1750
Alworth .....	-0-	Los Olmos .....	137
Angelita .....	-0-	Mercedes .....	165
Aviators .....	408	Mirando City .....	369
Baldwin .....	874	Mirando Valley .....	35
Barbacosa .....	15	Moca .....	666
Bruni .....	2200	O'Hern .....	2625
Carolina-Tex .....	5	Piedras Pintas .....	9
Charco Redondo .....	10	Plymouth .....	6790
Clara Driscoll .....	150	Premont Prospect .....	-0-
Cole East .....	32	Randado .....	322
Cole West .....	608	Rio Grande City .....	240
Cuellar .....	120	Roma .....	3
Comitas .....	6	Corpus Christi .....	1718
Driscoll .....	320	Sinton .....	50
Eagle Hill .....	425	Seven Sisters .....	2520
Escobas .....	1160	S. R. C. ....	53
Gov't Wells (N) .....	11792	White Point .....	20
Gov't Wells (South) .....	6024	Sam Fordyce .....	4686
Guerra .....	412	Sarnosa .....	957
Hagist .....	110	Saxet (Old) .....	2528
Henne-Winch-Faris .....	10	Saxet (New) .....	4967
Hoffman .....	40	Taft .....	150
Jennings .....	635	Cole Middle .....	56
Kingsville .....	56	South Clarkwood .....	20
Kohler .....	115	Loma Vista .....	75
Laurel .....	39	Piedra Lumbre .....	200
Loma Novia .....	9975		
			66,752

8. Rule 2 of Section A, Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Gulf Coast District is hereby readopted and amended as follows:



Rule 2. Not more than One Hundred Sixty Eight Thousand Seven Hundred Seventy Four (168,774) bbls. of oil (word illegible) shall be produced from said fields of said District during any day of the effective period of this Order, which shall be distributed to said fields as follows:

Allen Dome	15	Louise	1540
Anahuac	5000	Manvel (Miocene)	4000
Ariola	1375	Manvel (Oligocene)	3500
Bay City	500	Markham	1105
Big Creek	1043	Mykawa	280
Blue Ridge	1675	Mykawa (New)	3847
Boling	870	Nash Dome	38
Brenham	18	North Dayton	142
Brookshire	15	Old Ocean	424
Buckeye	174	Orchard	675
Batson	729	Orange	690
Batson (New)	1236	Pickett Ridge	900
Barbers Hill	17200	Port Neches	1805
Clay Creek	1133	Pierce Junction	3279
Cleveland	853	Pierce Junction (Vicks-	
Conroe	44025	burg	70
Damon Mound	482	Raccoon Bend	2883
Dickinson	1465	Raccoon Bend (Cock-	
Esperson Dome	1340	field)	1931
Fannett	973	Rockland	-0-
Goose Creek	2745	Saratoga	839
Gillock	(shut in)	Schwab	60
High Island	6780	South Houston	1153
Hankamer	1603	Sugarland	5580
Hankamer (New)	491	Sour Lake	1577
Hardin	365	South Liberty	685
Hastings	5200	Spindletop	2377
Hull (Old)	2825	Thompson	10738
Hull (New)	2846	Tomball	6250
Humble	3430	West Columbia	2340
Livingston	3100	Turtle Bay	150
Lost Lake	260	Withers	150



It is Further Ordered that allowable oil in the foregoing order is oil measured on 100 per cent tank tables according to the Pipe Line Rule Number Nine (9) and corrected to sixty (60) degrees Fahrenheit.

It is Further Ordered that this Cause be held open on the docket for such further orders as may be necessary and supported by evidence of record in above Cause.

RAILROAD COMMISSION OF  
TEXAS.

(Seal)

ERNEST O. THOMPSON,

Chairman.

C. V. TERRELL,

Commissioner.

LON A. SMITH,

Commissioner.

Attest:

C. F. PETET, Secretary.

917

EXHIBIT No. 49.

Railroad Commission of Texas.

Oil and Gas Division.

Oil and Gas Docket Nos. 108; 120, 123, 124, 125, 126, 128,  
129, 132 & 146.

In Re: Conservation and Prevention of Waste of Crude  
Petroleum and Natural Gas in the State of Texas.

Austin, Texas, March 23, 1936.

Special Order Fixing the Allowable Production of Crude  
Oil in the Various Fields and Districts in Texas.

Whereas, after due notice hearings have been held at  
Austin, Texas, at various times, including hearing on

March 18, 1936, with respect to the existence and imminence of waste of oil and gas in the State of Texas, and the prevention thereof; and

Whereas, in view of the evidence, including among other matters the physical conditions in the various fields, the transportation and marketing facilities, the reasonable market demand, the reasonableness of the allocation as between fields of the allowable production under previous orders; and

Whereas, the Railroad Commission of Texas finds from the evidence that the reasonable market demand for oil produced in this State from the various fields and districts therein equals the amount hereinafter shown as the allowable production thereof during the period beginning at 7 o'clock a. m., April 1, 1936, and ending at 7 o'clock a. m., May 1, 1936; and

Whereas, the Railroad Commission of Texas finds that waste exists or is imminent and that to prevent such waste of oil and gas, as the same is defined by the applicable Statutes, it is necessary to restrict the production of oil in the State of Texas as provided for herein, and

Whereas, The Railroad Commission's Special Order Fixing Allowable Production of Crude Oil in the Various Fields and Districts in Texas, dated August 26, 1935, contains the following language:

"We further find from the evidence the more wells that are drilled the greater will be the ultimate recovery of oil and gas from any given pool."

By this language the Commission did not mean and did not find from the evidence that the closer wells are drilled the greater will be the ultimate recovery of oil and gas

from any given pool, but by such language only meant and found from the evidence that the more wells that are drilled *in conformity with the spacing rules* as applicable to the various fields in Texas the greater will be the ultimate recovery of oil and/or gas from any given pool.

It was not then the intention and is not now the intention of the Railroad Commission to abrogate or abandon any of the spacing rules now in effect and applicable to the various oil and gas fields in Texas, nor to militate against the fact basis on which the Commission's spacing rules are based.

Now, Therefore, in order to prevent the waste of oil and gas in the State of Texas, which will take place by authorizing production over the said period in excess of the reasonable market demand;

It is Hereby Ordered that beginning at 7 o'clock a. m., Wednesday, April 1, 1936, and continuing to May 1, 1936; unless other periods are prescribed herein, the production of oil in the State of Texas, and the various fields therein, until further ordered, shall not exceed the amounts hereinafter shown as the allowable production thereof, and in order to adjust the current allowable production of crude oil in Texas, as nearly as may be, to the demand as shown, the allowable daily production of the various fields and districts in said State shall be limited to the amounts hereinafter specified and the following orders fixing such limitation on production in the various fields and districts are hereby adopted.

1. Rule 2 of Division 2 as contained in an order of this Commission dated October 17, 1933, pertaining to the Panhandle District of Texas is hereby readopted and amended as follows:

Rule 2. Not more than Sixty Thousand Eight Hundred (60,800) barrels of crude oil shall be produced from said sitrict during any day of the effective period of this Order. Moore County shall not produce in excess of Fifteen Hundred (1500) bbl. per day. Moore County allowable is additional to Panhandle allowable. The Osborne Area in Wheeler County shall not produce in excess of One Thousand (1,000) barrels per day. The Osborne Area allowable is in addition to the Panhandle allowable.

2. Rule 23 (a) of Division 3, as contained in an order of this Commission dated October 17, 1933, pertaining to the East Texas Field is hereby readopted and amended as follows:

Rule 23 (a). Whereas, The Railroad Commission of Texas finds from evidence submitted to it at a hearing held in Austin, Texas, on March 18, 1936, and at previous hearings held before this regulatory body, that the reservoir of the East Texas Field has its energy supplied by a hydrostatic drive which encroaches from the west to the east, and only a certain amount of crude oil can be withdrawn daily from the East Texas reservoir in order to utilize to the greatest extent the energy necessary for the production and recovery of the greatest amount of oil ultimately from the reservoir. It has been recommended to the Commission by competent engineers that not more than 425,000 to 450,000 barrels of crude oil should be allowed to be produced from the East Texas reservoir in any one day in order that the reservoir might be depleted with the least amount of waste incurring. Evidence was also submitted to the Commission at these hearings that the production of from 425,000 to 450,000 barrels of crude oil will prohibit the coning of water; the uneven encroachment of water, and the subsequent trapping of much oil that otherwise, under higher daily allowables of crude oil, would not be recovered.

Therefore, it is Further Ordered by the Railroad Commission of Texas, that during each twenty-four (24) hour period beginning at 7 o'clock a. m., Central Standard Time, April 1, 1936, the owner or operator or manager of each well in the East Texas Field shall be permitted, either collectively or individually, to produce daily from each well a maximum of Two Point Eighty Five, (2.85%) Per Cent of its average hourly potential producing capacity as determined by the Commission.

3. Rule 2 of Division 5, as contained in an order of this Commission dated October 17, 1933, pertaining to the North Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Sixty Thousand (60,000) barrels of crude oil shall be produced from said district during any day of the effective period of this Order. Foard County shall not produce in excess of Five Hundred (500) barrels daily. Foard County allowable is in addition to North Texas allowable.

4. Rule 2 of Division 5, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Three Thousand and Eight (53,008) barrels of crude oil shall be produced from said District during any day of the effective period of this Order, which is distributed to the various counties as follows:

Brown .....	1727	Palo Pinto .....	360
Callahan .....	1596	Reagan (Big Lake) ..	9000
Coleman .....	1172	Reagan (Grayson) ...	172

Comanche .....	74	McCullough .....	1
Crockett (Todd) .....	10	Runnels .....	313
Crockett (World) .....	1060	Shackelford .....	6477
Eastland .....	2936	Stephens .....	4653
Erath .....	112	Throckmorton .....	464
Fisher .....	5875	Taylor .....	126
Haskell .....	18	Upton (McCamey) ...	8782
Irion .....	42	Young South/2 .....	4323
Jones .....	3653	Webb-Ray .....	62

5. Rule 4 of Division 7, as contained in an order of this Commission dated October 17, 1933, pertaining to the West Texas District is hereby readopted and amended as follows:

Rule 4. Not more than One Hundred Fifty Three Thousand Four Hundred Six (153,406) barrels of crude oil per day shall be produced from said District during any day of the effective period of this Order, which shall be distributed to the various fields therein as follows:

Bashara .....	22	McKinzie .....	5
Brown-Altman .....	1389	Monroe .....	25
Church-Fields .....	6960	Netterville .....	99
Cowden, North .....	6350	Northwest .....	28
Cowden, South .....	400	Parker .....	50
Crane-Cowden .....	572	Pecos Valley .....	422
Deep Rock .....	350	Penwell .....	6718
Dobbs .....	100	Richards .....	10
Edwards .....	16	Sand Hills .....	240
Emperor .....	515	Sand Hills (Ordovician)	60
Foster .....	180	Sayre .....	4350
Fuhrmans .....	750	Scarbrough .....	1885
Goldsmith .....	414	Sealey (1st no. illegi-	
Gulf-McElroy .....	4610	ble) .....	535
Halley .....	149	Shipley .....	1580



Harper .....	96	Tobarg .....	2200
Hendricks .....	13815	Taylor-Link .....	1350
Howard-Glasscock ..	20000	Waddell .....	2012
Iaatan-E. Howard ..	4,800	Walker .....	10
Johnson .....	30	Ward, North .....	10075
Keyes .....	100	Ward, South .....	14170
Keystone .....	1268	Westbrook .....	867
Leck .....	500	Wheat .....	1850
Masterson .....	211	White & Baker .....	3
Means .....	1466	Yates .....	38837
McClintic .....	932		

6. Rule 2 of Division 4, as contained in an Order of this Commission dated October 17, 1933, pertaining to the East Central Texas District is hereby readopted and amended as follows:

Rule 2. Not more than Fifty Thousand Nine Hundred Fifty (50,950) barrels of crude oil per day shall be produced from said fields in said District during any day of the period of April 1, 1936, to May 1, 1936; said amounts shall be allocated to the various fields in the following amount:

Bethany .....	16	Pottsboro .....	4
Boggy Creek .....	573	Rusk .....	225
Camp Hill .....	660	Richland .....	28
Cayuga .....	5274	Powell .....	2321
Curry .....	127	Rodessa .....	1200
Corsicana .....	411	South Bosque .....	11
East Freestone .....	8	Van .....	35733
Long Lake .....	750	Van Shallow .....	153
Mexia .....	2187	Trinity .....	1091
Post Oak .....	1	Wortham .....	95
Potter .....	70	Worthem (Shallow) ..	12

7. Rule 2 of Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the



Southwest Texas District is hereby readopted and amended as follows:

Rule 2. Not more than One Hundred Forty Three Thousand Two Hundred Sixty Three (143,263) barrels of crude oil shall be produced in said District during any day of the effective date of this Order, and same shall be distributed as follows:

### Division I.

Aita Vista .....	5	Larremore .....	40
Bateman .....	206	Loma Alto .....	80
Bob Rose .....	25	Lowe .....	-0-
Buchanan .....	39	Luling-Branyon .....	5923
Callaham .....	148	Lytton-Springs .....	371
Carröll .....	28	Manford .....	33
Cedar Creek .....	44	Matthews .....	52
Cedar Creek (N) .....	54	Meaders .....	-0-
Chapman-Abbott .....	333	Minerva Rockdale .....	227
Chicon Lake .....	17	Noack .....	325
Clark .....	500	Pearsall .....	1000
Cooksey .....	12	Schimmel-Batts .....	1
Darst Creek .....	8986	Somerset .....	700
Dale .....	160	Southton .....	67
Dunlap .....	10	Staples .....	3
Eckert .....	269	Taylor Ina .....	5
Espada Mission .....	1	Thrall .....	46
Gas Ridge .....	8	Salt Flat .....	4268
Hilbig .....	791	Von Ormy .....	83
Jones .....	-0-	Yeast .....	50
Jacobs .....	610	Zoborski .....	4
Kimbro .....			
Kimbro (New) .....	48		
			<hr/> 25572

## Division II.

Caesar .....	1293	Placedo .....	2050
Coletta Creek .....	780	Pettus .....	1408
Diamond Hall .....	80	Pettus (New) .....	1000
Dinero .....	92	Port Lavaca .....	700
Dirks .....	5280	Quintanna-O'Connor .....	3200
Fort Merrill .....	57	Ray .....	1831
Greta .....	14930	Refugio (Deep Sand) .....	111
Greta Deep .....	1180	Refugio (New) .....	2325
Keeran .....	300	Refugio (Old) .....	2520
McFadden .....	26	Hords Creek .....	90
Maritz .....	150	Tuleta .....	1400
McNeil .....	122	Vanderbilt .....	100
Mineral .....	-0-	Worthington .....	74
Mt. Lucas .....	60	Whittington .....	6
Normanna .....	12		
O'Connor-McFadden .....	275		41452

## Division IV.

Albercos .....	100	Loma Vista .....	75
Alworth .....	-0-	Lopez .....	2520
Angelita .....	-0-	Los Olmos .....	146
Aviators .....	408	Mercedes .....	140
Baldwin .....	874	Mirando City .....	351
Barbacosa .....	15	Mirando Valley .....	32
Bruni .....	2200	Moca .....	666
Carolina-Tex .....	5	O'Hern .....	2800
Charco Redondo .....	10	Piedra Lumbre .....	360
Clara Driscoll .....	150	Piedra Pintas .....	-0-
Cole East .....	32	Plymouth .....	8130
Cole West .....	593	Premont Prospect .....	-0-
Cole Middle .....	56	Randado .....	320
Cuella .....	114	Rio Grande City .....	235
Comitas .....	10	Roma .....	3
Driscoll .....	360	Corpus Christi .....	4306

Eagle Hill .....	426	Sinton .....	10
Escobas .....	1109	Seven Sisters .....	3500
Gov't Wells (N) .....	11704	S. R. C. ....	26
Gov't Wells (S) .....	6021	Sam Fordyce .....	5126
Guerra .....	412	Sarnosa .....	957
Hagist .....	50	Saxet (Old) .....	2195
Henne-Winch-Farris ..	10	Saxet (New) .....	6180
Hoffman .....	340	South Clarkwood ..	20
Jennings .....	655	Taft .....	300
Kingsville .....	60	White Point .....	20
Kohler .....	97		
Laurel .....	40		76,239
Loma Nova .....	11970		

8. Rule 2 of Section A, Division 8, as contained in an order of this Commission dated October 17, 1933, pertaining to the Gulf Coast District is hereby readopted and amended as follows:

Rule 2. Not more than One Hundred Seventy Nine Thousand and Thirty Four (179,034) barrels of crude oil shall be produced from said fields of said district during any day of the effective period of this Order, which shall be distributed to said fields as follows:

Amelia .....	150	Livingston .....	3188
Allen Dome .....	16	Manvel (Miocene) ...	5000
Anahuac .....	5900	Manvel (Oligocene) ..	4500
Ariola .....	1375	Markham .....	1371
Bay City .....	750	Mykawa .....	229
Big Creek .....	1006	Mykawa (New) .....	3927
Blue Ridge .....	1555	Nash Dome .....	36
Boling .....	735	North Dayton .....	133
Brenham .....	19	Old Ocean .....	424
Brookshire .....	15	Orchard .....	628
Buckeye .....	218	Orange .....	680
Batson .....	743	Pickett Ridge .....	1050

Batson (New) .....	1497	Port Neches .....	1805
Barbers Hill .....	17200	Pierce Junction .....	3315
Clay Creek .....	1133	Pierce Junction (Vicks-	
Cleveland .....	962	burg) .....	70
Conroe .....	46025	Raccoon Bend .....	2883
Damon Mound .....	497	Raccoon Bend (Cock-	
Dickinson .....	1565	field) .....	3000
Esperson Dome .....	1340	Rockland .....	-01
Fannett .....	1013	Saratoga .....	973
Goose Creek .....	3053	Schwab .....	60
Gillock .....	(shut in)	South Houston .....	1425
High Island .....	6780	Sugarland .....	5580
Hankamer .....	1801	Sour Lake .....	1572
Hankamer (New) .....	587	South Liberty .....	646
Hardin .....	365	Spindletop .....	2507
Hastings .....	5900	Thompson .....	10738
Hull (Old) .....	2915	Tomball .....	7500
Hull (New) .....	2710	West Columbia .....	2340
Humble .....	3430	Withers .....	150
Lost Lake .....	200	Turtle Bay .....	300
Louise .....	1540	Shepherd's Mott .....	9

It is Further Ordered that allowable oil in the foregoing order is oil measured on 100 per cent tank tables according to the Pipe Line Rule Number Nine (9) and corrected to sixty (60) degrees Fahrenheit.

It is Further Ordered that this Cause be held open on the docket for such further orders as may be necessary and supported by evidence of record in above Cause.

# RAILROAD COMMISSION OF TEXAS.

ERNEST O. THOMPSON,

Chairman.

C. V. TERRELL,

Commissioner.

LON A. SMITH,

Commissioner.

Attest:

C. F. PETET, Secretary.

928

## EXHIBIT 50.

= 1 R. M. Wood 1 Acre, W. H. Castleberry Survey, Gregg County.

Case No. 21,418. Rule 37.

Applicant: R. M. Wood, c/o Jack Hearrell, Gladewater, Texas.

The application of R. M. Wood for an exception under the provisions of Rule 37 coming on to be heard on the 18th day of December, 1936, by the Railroad Commission of Texas, and it appearing that the petition shows good cause; that no injustice will be done by the granting of such exception, and that same should be granted to prevent confiscation of property:

Now, therefore, it is Ordered that the application of R. M. Wood for an exception under the provisions of Rule 37 and a permit to drill well No. 1 on the R. M. Wood 1 acre tract on the W. H. Castleberry Survey, Gregg County, Texas, as shown by plat submitted, is hereby approved, and applicant is granted permission to drill well No. 1, to be spaced as follows:

30 feet north of the south line;

50 feet west of the east line.

Entered at Austin, Texas, on this the 23 day of Dec., 1936.

ERNEST O. THOMPSON,

Chairman,

C. V. TERRELL,

Commissioner,

.....  
Commissioner.

Attest:

C. F. PETET,

Secretary.

(Seal)

The above and foregoing is a true and correct copy of an order of the Railroad Commission of Texas entered on the above date.

LATEN STANBERRY,  
Chief Supervisor.

929

## EXHIBIT 51.

Motion For Rehearing

By

Shell Petroleum Corporation.

Case No. 21,418. Rule 37.

Applicant: R. M. Wood, c/o Jack Hearrell, Gladewater,  
Texas.

Motion for rehearing in the above styled case having been this date considered by the Railroad Commission of Texas, and it appearing that the reasons set out in said motion are sufficient to justify the granting of a rehearing covering the application of R. M. Wood for special permit to drill well No. 1, R. M. Wood one-acre tract, W. H. Castleberry y in Gregg County, Texas:

Now, therefore, it is Ordered that the motion for rehearing filed by Dan Moody, Attorney for Shell Petroleum Corporation, in the above styled case, is hereby granted.

Entered at Austin, Texas, on this the 21st day of January, 1937.

C. V. TERRELL,

Chairman,

LON A. SMITH,

Commissioner,

ERNEST O. THOMPSON,

Commissioner.

Attest:

C. F. PETET,

Secretary.

(Seal)

The above and foregoing is a true and correct copy of an order of the Railroad Commission entered on the above date.

LATEN STANBERRY,

Chief Supervisor, Oil and Gas  
Division.

930

# EXHIBIT 52.

Permit Reaffirmed.

=1. R. M. Wood, 1 Acre Tract, W. H. Castleberry Survey,  
Gregg County, Texas.

Case No. 21,418. Rule 37.

Applicant: R. M. Wood, c/o Jack Hearrell, Gladewater,  
Texas.

Whereas, on December 23, 1936, the Railroad Commission of Texas after hearing and due consideration of the application of R. M. Wood for special permit to drill well No. 1, R. M. Wood one-acre tract, W. H. Castle-



berry Survey, Gregg County, Texas, granted to applicant a permit to drill said well No. 1, and

Whereas, on February 11-12, 1937, a rehearing was held on this application at which sufficient evidence did not exist to justify the cancellation of the above permit:

Now, therefore, it is Ordered, that the permit granted to R. M. Wood dated December 23, 1936, to drill well No. 1, R. M. Wood one-acre tract, W. H. Castleberry Survey, Gregg County, Texas, as shown by plat submitted, be reaffirmed, and applicant granted permission to drill well No. 1 to be spaced as follows:

30 feet north of the south line, and  
50 feet west of the east line.

Entered at Austin, Texas, on this the 4th day of March, 1937.

C. V. TERRELL,

Chairman,

ERNEST O. THOMPSON,

Commissioner,

LON A. SMITH,

Commissioner.

Attest:

C. F. PETET,

Secretary.

FINDINGS OF FACT AND CONCLUSIONS OF  
LAW.

(Title Omitted.)

The following findings of fact and conclusions of law are directed to be filed by the Clerk in accordance with the rules of this Court:

## Findings of Fact.

1. The East Texas oil field or pool is a common reservoir. It was discovered in the Fall of 1930. It consists of an oil saturated portion of a stratum or deposit of sand known as the Woodbine sand, and, considering surface area, the field now covers approximately 133,000 acres located in Upshur, Gregg, Smith and Rusk Counties. It is approximately forty miles in length, with an average width of some four miles.

2. According to the geologists, many years ago there was a great land mass, known as the Sabine Uplift (roughly corresponding to the Florida Peninsula) which was the eastern limits of an ancient sea. In course of time, sands and other minerals were washed from the high lands into the sea, forming a beach very similar to the beaches along the Gulf Coast. No doubt a small amount of materials other than sand, such as volcanic ash and shales, were deposited in the sea itself, becoming mixed in the sand body. This sand deposit covered an earlier, impervious formation called the Georgetown lime. Later the entire area sank, and was covered by another impervious formation called the Austin Chalk, and then by other formations, not necessary to identify, which extended on up to the surface.

3. The Woodbine sand in the oil field or pool is now found some 3600 feet below the surface. The sand pinches out at the eastern limit of the Woodbine formation, or at the extreme edge of the shore line of the ancient sea, and extends westward in varying thickness for many miles, and with a downward dip near the old shore line where the oil is found. The Woodbine sand body was at various points folded and buckled ages ago, leaving the western end exposed at the surface at the present time. This outcrop at the surface, exposed to water infiltration, covers a large area some 150 miles to the north and west of the field, roughly represented by a line running from Waco north between Fort Worth and Dallas, then north and east to Paris.

4. The Woodbine sand stratum or deposit is a huge porous medium or reservoir or sand body with the high end west of Dallas, and with the low end forming the East Texas oil producing zone. There is a difference in elevation of at least 3,000 feet between the upper and lower ends. The formation resembles a great distorted "U" tube, with the eastern or oil-pool end much smaller than the broad, wide-mouthed western end which is exposed at the surface or at the outcrop. The Woodbine sand is essentially a water sand, the water forming a hydrostatic head having a virgin pressure of about 1600 pounds per square inch in the oil producing zone in the East Texas field. The oil pool is, therefore, an accumulation of oil in the pore spaces of the eastern limits of the Woodbine sand. The oil is trapped in the sand by the Austin Chalk above, by the Georgetown Lime below, both impervious formations, and by salt water which is in the Woodbine section. The water is under approximately the west one-half of the pool, and extends, of course, throughout the sand to the west of the pool, and on to the surface.

5. The column of water which is in the Woodbine sand, being in contact with the oil itself, exerts a hydrostatic pressure, which, at the discovery of the pool, amounted to about 1600 pounds per square inch. The oil bearing portion of the sand, seen in cross section from east to west, resembles a triangle; the long or top side of which is a portion of the Austin Chalk; the eastern leg is a portion of the Georgetown Lime; and the lower or western leg is the water contact. It follows that the sands along the eastern edge of the field are thin. Going westward the oil saturated sands become thicker, reaching a maximum thickness in the center of the oil pool of about 100 feet. Going further westward along the lower leg of the triangle along the line of oil-water contact, the oil saturated portion of the sand becomes thin, until the western edge of the field is reached where nothing but water is found. A line drawn more or less through the center of the field, from north to south, passes through the area of maximum thickness of the oil saturated sand, and is more or less the center of what is called the "fairway", or the best part of the field.

6. Being a common reservoir, the fluids therein migrate rather freely, with possible exception of a few small areas of no consequence with respect to issues here involved. Furthermore, pressure is readily transmitted from one point to another, and always there is an adjustment of pressures in the seeking of an equilibrium. The reservoir fluids move, of course, from high pressure areas to low pressure areas. While in some portions of the pool the sand is more porous, and more permeable than in others, and while in some portions there are found volcanic ash, shale and other materials in different quantities and in different locations than in other portions of the field, it may be said that, on the whole, the Woodbine sand

is fairly uniform, having an average porosity of about 25%, and with relatively uniform saturation of oil. A large number of cores or sections of the oil saturated sand have been examined, and the shale or ash or other non-porous substance found in one core is not always found in another, or not found exactly at the same level as in another; and an area of tight sand in one core is not found at the same location as in other cores; however, aside from these variations, which are to be expected, the porosity in the different cores is on the average rather uniform, and particularly so in any given area of the field. The present potential map of the Commission, hereafter explained, from which well allowables are calculated, certainly reflects no lack of uniformity in these conditions. Indeed, the map, contoured from a few key wells, necessarily assumes a high degree of uniformity over wide areas and distances.

7. While the extreme edges of the field offer some complications not encountered elsewhere, but which can be reasonably predicted and which are not of real importance here, considering the field as a whole, it appears definitely that data are now and have been available for some years from which it is possible to determine with reasonable accuracy the character and thickness of the sands, the type of well which will be obtained in any given area, and the recoverable oil in the field as a whole. Some 26,000 well logs have been filed with the Railroad Commission by the operators, numerous Schlumberger tests, which are now considered to be very accurate, have been taken, and this information has been disseminated generally by way of periodicals, papers, surveys made by the Bureau of  
 936 Mines, and the like. It is clearly established that an excessive allowable for the field, say 1,000,000 barrels a day, will result in a lower ultimate recovery than that which would occur under a smaller allowable

of some 500,000 barrels a day. The parties do not attack, however, the top allowable of 522,000 barrels a day, but there was, notwithstanding, one witness for the State who testified that the daily allowable could be materially increased without causing substantial waste, but such witness admitted that he was one of a very few who had such an opinion and he was not expressing the views of the Commission or its engineers. In any event, complainant and defendants agree that there is no issue with respect to the top allowable, and proof as to the necessity of maintaining an allowable of some 500,000 barrels or less a day has not been fully developed. Since it is generally admitted that excessive production will cause waste, estimates of recoverable oil have necessarily been based on a definite assumption of the general producing conditions which will prevail. In short, a wealth of information is already before the Commission from which it can determine the productivity, or at least the relative productivity, of the various leases in the field, in terms of relative recoverable oil under practical operating conditions.

8. The East Texas field is essentially a water drive field, and will be such until pressures become so low that gas will generally come out of solution, which is to say that the pressure of the column of water in the Woodbine sand, a hydrostatic pressure, tends to force the fluids from the reservoir to the surface. When a well is opened for production a differential pressure is created which causes the fluids to move to the points of least resistance. The hydrostatic pressure, plus expansion of gas, cause most of the wells to flow. If large quantities of fluid are removed, as in 1933 and 1937 in the early days of the field, the pressure drop is considerable, extending in varying degrees from the well bore back into the reservoir. Since the hydrostatic head of water is to the west of the field,



and water is under the western one-half, the pressure is greater along the west side of the field than it is along the east side, resulting in what is called a pressure gradient from west to east across the field, being lower on the east. As fluids are withdrawn there is a slight expansion of the reservoir contents and a gradual encroachment of the water which occupies the remaining space not taken by expansion. There is a tendency for the water table to rise or encroach gradually as fluids are removed; consequently, after the recoverable oil has been removed, the reservoir space occupied by the oil and its dissolved gas will be occupied by the salt water. Due to some variations, in places, in the porosity of the Woodbine sand, and due to variations in permeability, but particularly to a number of areas where there have been concentrated withdrawals, the water table has not advanced upward and eastward as an absolutely level table, for it is higher in some places than others; but, for all practical purposes, it may be said that the water table is rising in a plane, or as a table, gradually making non-productive of oil the areas along the west edge of the field. Gradually the thickness of the productive sands is decreasing as the water table rises. Furthermore, under open flow production, or under almost any plan of production which permits the production of wells in commercial quantities over the entire field at the same time, the movement of oil up structure from west to east will take place. Such movement could, it seems, be prevented by drilling wells along the western edge, producing them until drowned out, then, drilling again further up structure, and repeating this procedure,

938      until finally the eastern edge of the field was reached. Obviously, such a program is not feasible, for operators up structure would have to wait for years before having any production, foregoing present income, to say nothing of losing leases. Any practical plan, with all wells producing reasonable



amounts, will cause oil to move in some degree up structure, but not as much so as the present plan or order. For this reason, operators along the west edge of the field are not as advantageously situated as those up structure, and the wells in the west will sooner or later be drowned out by encroaching water, while wells to the east will still produce. Position on structure, thickness of sands, and distribution of allowable, all enter into ultimate recovery from any lease or area. Natural advantage can be changed, either increased or decreased, by the method of distribution of production. The present per-well method does not reduce avoidable drainage to a reasonable minimum. By such method, reasonably avoidable drainage is aggravated, and to the material damage of complainant.

9. While on the whole the pressure gradient is high on the west and low on the east, and while the reservoir fluids on the whole tend to move up structure, there are exceptions which are most important. For instance, there are many areas where drilling is dense, and relatively the withdrawal of reservoir fluids (oil, water and gas) is much higher than elsewhere. These regions of concentrated withdrawals cause low pressure areas which in turn cause migration of oil to such areas. The migration in such an instance is not limited to an up structure movement. Oil will move down structure, and in fact in any direction, to a low pressure area. There are many areas to the west, and in fact in all directions, of complainant's tract, which are more densely drilled and where pressures are lower. Obviously, complainant's ultimate recovery will be materially reduced by such conditions, largely caused by the drilling pattern and method of distribution.

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10. The field was rapidly developed by a large number of operators. The original orders

of the Railroad Commission, undertaking to regulate production, provided for proration units, and encouraged rather wide spacing by giving substantial value to acreage in the formula for distributing the allowable. However, beginning with the order of September 2, 1931, the Commission began its series of orders providing for distribution of the allowable production solely on the flat per-well basis. Each well, regardless of its size, or the area of the tract upon which it was situated, was given the same allowable production. The validity of the orders limiting production in the field was involved in many suits over a period of several years. There were several grounds for the attacks, not necessary to mention, but they included invalidity based on the per-well method of distribution. The complainant, in March, 1933, attacked the validity of the order because the same was on a well basis, and a few months later, attacked another order based on potentials calculated from a few key wells, and at that time there were substantially less than 10,000 wells in the field and the drilling pattern and density were quite different from those which exist today. Temporary injunction was denied, and the case was not tried on its merits.

11. The first order based on potential was in April, 1933, and the field was placed on a "per-well-potential" method. The potentials from which to calculate potentials of other wells, were taken on about 75 wells, and even these were not wide open-flow potentials all taken at the same time, but were taken over a three-hour period as they tested each well. In selecting the key wells, the Commission picked them right down the center of the field. The wells were selected with reference to their uniform mechanical condition as nearly as possible. In the event some of the wells made potentials that were not thought to be in reasonable relation to the others, these tests were thrown out and a search would begin to find other

wells which would come up to what were expected of them. The Commission then contoured the field on lines of equal potential. Its engineers, in selecting key wells, avoided coming too close to the western edge of the field because the sudden rapid production of wells there might cause them to produce water. It was necessary, therefore, for the engineers, in order to draw contour lines for the edges of the field, to space evenly and contour lines from the last point of control over to the western edge, and as they were contouring in hundred barrel contours, they equally so spaced their lines. If they were a mile from the western edge, they divided that mile into five equal parts and stepped down from a potential of 500 barrels a well to 0 barrels in even steps, and likewise the same thing was done on the eastern side of the field. Such a method of fixing potential contour lines was, however, resorted to on the eastern side not on account of water, but because most of the wells there were small wells, pumping wells, or wells equipped with small flow lines, and the operators were not willing to put their wells up for a test as representative of that test. Likewise, on the east side of the field, the last point of control was anywhere from one-half to three-quarters of a mile from the eastern extremity of the field, and contours were spaced accordingly, and so, the Commission made its early potential map. Later, some wells were completed by drilling deep into the sand in order to get the highest potential, since the depth of penetration into the sand controlled, to a substantial extent, the potential of a well. For further data to be used for the potential contour map, few potentials have been taken since 1933, but the contour lines on the east and west have remained substantially the same. The most that can be said of a potential is that it reflects accurately only the mechanical efficiency of a well to produce at the time and under the conditions existing when the test was made.

Relatively, it may indicate in some small way other factors. Pressure is truly represented by bottom hole or depth pressure tests, which the Commission takes monthly. During the first eight years, the pressure dropped about 515 pounds. Two potential tests taken on wells on adjoining tracts, where the sand and other reservoir conditions are substantially the same, will show substantially the same potential only where like equipment is used, the same penetration is made into the sand, and the same back pressure maintained on the wells when the tests are made. Wells throughout the field are equipped and drilled differently. The potentials as taken and calculated in the East Texas field are, therefore, fictitious to a great degree, even with respect to reflecting the mechanical ability of the well to produce. They do, however, serve as some slight basis for a comparison of wells in the field, but the contour lines, as shown in many places on the contour map used for ascertaining allowables, do not reflect the real potentials of a great number of wells in the field. For illustration, one witness testified that about six months prior to the trial of this case, he was employed to check 156 wells lying on the east side of the field around the town of Joinerville in the Isaac Parker Survey. By the contour map, a majority of the wells checked were given between 100 and 200 barrels an hour potential, and the rest of them between 100 and 0, yet not one well out of the 156 was capable of making 20 barrels during a period of twenty-four hours. Many of the wells on the east side, which are on the pump, were given a potential of 200 to 300 barrels an hour, whereas there is no machinery used in the field capable of pumping 300 barrels an hour. After the potentials were taken for the drawing of a contour map, contour lines were

942 drawn and the properties within the contour lines were assigned arbitrarily a potential based upon the potential of the wells through which the con-

four lines were drawn. If an operator felt aggrieved, he could request a potential to be taken for his well, and the Commission would make an adjustment accordingly; but where his grievance was that his potential was accurate, but he was suffering confiscation by virtue of numerous other wells in the field having too high potentials, or being given allowables which were too high, the privilege meant nothing. Having prepared the contour map, a schedule was then compiled by the Commission, giving the names of the operators, the leases, surveys, and counties in which the wells were located, the number of each well, and its potential, and then, in either the front or the back, was contained a key system whereby one could look up the potential to see what the daily allowable of that particular well would be. The proration order, as interpreted by the Commission, plus the determination of potentials, plus the schedules showing wells and potentials, as determined by the Commission, all constitute the plan or method of distributing the allowable production for the field. The order, or more accurately, the plan of distribution of allowable for the field, has never attempted for several years to take into account the surface acreage in any lease or its oil reserves. Generally, where the wells were drilled and equipped the same, a well on one-tenth of an acre, adjacent to a tract with one well on ten acres, had exactly the same potential and was given by the Commission the same potential and allowable. Thus, such a well on one-tenth of an acre, under the order of the Commission, has been permitted to produce approximately one hundred times as much as a similar well on a ten acre tract.

12. The 71 key wells which are now used are distributed substantially as the original wells were. To a large degree, the original map is still used, revised somewhat after subsequent tests. The method of contouring



943 and the method of determining potentials of wells from their location with respect to contour lines drawn as stated, necessarily assumes reasonable uniformity in sand conditions between contour lines and between wells on the same contour. If there is a variance in sand conditions, as contended by respondents, then certainly the contour lines, as drawn by the Commission, give no indication whatsoever of same. However, the arbitrary giving of potentials to the weaker wells of many times more than their actual producing capacities became unimportant, because when each well which could make it was given 20 barrels per day, there were only some 7,000 barrels a day to be allocated among the better wells in the field. The pertinent part of the order and its application is very clearly reflected by the following stipulation between the parties:

"1. The total daily allowable for the East Texas field as fixed by the Railroad Commission order in force at the time of trial was about 522,500 barrels of oil.

"2. The order promulgated by the Railroad Commission and in force at the time of trial for the proration of this field allowable among the wells in the field provided: 'the owner or operator or manager of each well in the East Texas field shall be permitted, either collectively or individually, to produce daily from each well a maximum of two and thirty-two hundredths (2.32) per cent of its hourly potential capacity as determined by the Commission.'

"3. In the application and enforcement of the above proration order (a) each well that could not produce as much as 20 barrels of oil per day was allowed to produce the maximum amount that it could produce; (b) where 2.32% of the hourly potential of any well would amount to less than 20 barrels per day, the well was

allowed to produce 20 barrels of oil per day; (c) where 2.32% of the hourly potential of any well would amount to more than 20 barrels of oil per day, such well was allowed to produce 2.32% of its hourly potential.

"This application of the order resulted in the following: Approximately 451 wells, not any one of which was capable of producing as much as 20 barrels per day, were allowed to produce daily a total of approximately 5,250 barrels. Approximately 19,032 wells whose individual hourly potential when multiplied by 2.32% amounted to less than 20 barrels, were each allowed to produce a full 20 barrels per day; or from all of such wells a total of approximately 380,640 barrels per day. These were wells whose hourly potential ranged anywhere from 1 barrel to 860 barrels per hour. Approximately 6,325 wells whose individual potential when multiplied by 2.32% amounted to more than 20 barrels were each allowed to produce daily that number of barrels which equaled the product of its hourly potential multiplied by 2.32%. The total daily production from these wells was approximately 136,610 barrels. These wells had an hourly potential ranging from 865 barrels per hour to about 1,100 barrels per hour. In practical operation, the daily allowable of no well was controlled by the factor 2.32% of its hourly potential unless such well had a potential of 865 barrels or more per hour.

"The plaintiff offered testimony to show that if each well in the field that could not make 20 barrels per day was allowed to produce the maximum which it was capable of producing, and if every well in the field that was capable of making 20 barrels per day was allowed to produce 20 barrels per day, that the aggregate of such production amounted to some 510,000 or 515,000 barrels of the daily allowable of approximately 522,500 bar-



rels, with the result that only about 7,000 to 12,000 barrels of the total daily production was in the practical application of the order of the Commission prorated on the factor of 2.32% of the hourly potential of the wells.

4. The testimony shows that the wells were shut down on Saturdays and Sundays and were allowed to produce only five (5) days each week and the figures referred to in the testimony were for the days on which the wells were allowed to produce."

Furthermore, as far as effect is concerned, it is immaterial whether it be said that the Commission arbitrarily increased potentials so that each well be allowed to produce as much as 20 barrels if allowed to produce 2.32% of its assigned potential, or whether, ignoring the potentials, each well was given as much as 20 barrels. It is clear that in practice, and as part of the program of limitation, of allowable and distribution thereof, each well was authorized to produce 20 barrels if it could do so, and this left a small amount for the better wells and properties.

Although the amount to be allocated on a potential basis was stipulated as 7,000 to 12,000 barrels, it is quite clear from the testimony of the Commission's own engineer that the true amount was 7,000 barrels.

945 13. When the original per well potential method of distribution was initiated in 1933, the allowable for the field was approximately 750,000 barrels per day for far less than 10,000 wells, and, consequently, there was a considerable spread between the wells of low and high potential. Furthermore, the spacing was more uniform. 17,000 wells were drilled since April, 1933.

14. At the high rates of flow allowed during the greater part of 1933, the average reservoir pressure in the field dropped very substantially, clearly showing dissipation of reservoir energy and the great danger of premature and irregular water encroachment. The Commission, by gradual steps, reduced the allowable by the end of 1933 to about 400,000 barrels per day, and, since that time, it has varied between 400,000 and 550,000 barrels per day. The high rates of flow during the greater part of 1933 gave undisputed proof of the wasteful results of too high rates of flow. Since 1933 many wells have been drilled, so that with the allowable being cut from about 800,000 barrels a day in the Spring of 1933 to about 520,000 barrels a day at the present time, which, with Saturday and Sunday shutdowns now in effect, instead of seven days, as then, the average daily allowable is less than 400,000 barrels, the spread between the good wells and properties has become less and less, so that now the distribution is again practically on a per well basis. Indeed, it is almost 99% on a per well basis. Complainant's situation has completely changed from what it was in May, 1933. The high daily allowable in 1933 has dropped to an average now of 14 to 16 barrels a day.

15. For years the Commission has had in effect what is called "Rule 37" for the East Texas field, which has to do with well spacing. For a period the spacing of wells 300 feet apart was allowed, but in the Spring of 1934 the spacing was increased. Since the Spring of 1934, the rule in substance has provided that, 946 with exceptions mentioned hereafter, wells shall not be drilled closer than 330 feet to the property line or closer than 660 feet to another well on the same lease. In effect: the rule contemplates a uniform 10-acre spacing, each well having 10 acres in the form of a square around it. The rule also provides that the

Commission, after notice and hearing, may grant exceptions to the rule in order to prevent waste or to prevent confiscation of property. There is no need to detail the changes which have been made from time to time in Rule 37 prior to the promulgation of the rule now in effect. It is sufficient here to say that a great number of exceptions have been granted, so that most of the wells in the field have been drilled under exceptions to the spacing rule. One exception has called for another, so that the average acreage for each well has steadily decreased, and the number of unnecessary wells has steadily increased. With distribution on a purported per-well-potential basis, now really a flat per-well basis, the incentive to drill more wells is obvious, and the effect of granting exceptions to the 10-acre spacing rule is likewise obvious. It is to make more money, rather than primarily to recover more oil. Except in a few isolated areas, one well will efficiently drain ten acres, and, therefore, the predicament that the Commission finds itself in now is due solely to the relaxation of Rule 37. The Commission, to prevent inequities arising from granting of exceptions, has not attempted adjustment of allowables, nor has the Commission provided for pooling of tracts to prevent confiscation, inequities and unnecessary drilling.

16. At the time of the trial of this cause there were approximately 26,000 wells in the field. There are only a few tracts where the density is one well to 10 acres. The average density for the entire field is now one well

947 to 5.133 acres. There are many densely drilled areas, particularly in the townsites. For instance, in London, there are 154 wells producing on 51.41 acres, or approximately 3 wells to 1 acre; in Glade-water, there are 249 wells producing on 321.43 acres, or approximately 1 well to 1.3 acres; in Kilgore, there are 697 wells producing on 721.33 acres, or approximately 1

well to 1.03 acres. Breaking it down still further, there are instances of 15 wells on 2.59 acres, 10 wells on 3.5 acres, 4 wells on .75 acres, 19 wells on 2.61 acres, 11 wells on 3.04 acres, 16 wells on 16.36 acres, 3 wells on .53 acres, 10 wells on 3.6 acres, 5 wells on .30 acres, 5 wells on .75 acres, 4 wells on .65 acres, 6 wells on 1.5 acres, 5 wells on 1.5 acres, 5 wells on .75 acres, 7 wells on 1.61 acres, 24 wells on 24.35 acres, 26 wells on 19.5 acres. There are many other such instances of closely drilled tracts as the maps in evidence show, many of which are near complainant's tract. In this connection, the exhibits show that The Ambassador Oil Company on the Hamilton Heirs Lease, containing .48 acres, has five wells. At 20 barrels each per day, these wells are producing at the rate of over 200 barrels per acre per day, as compared to complainant's getting only 4.4 barrels per acre per day, or on a yearly basis of 261 days (5 days per week) at the rate of over 52,000 barrels per acre per year recovery, as compared with complainant's 1144 barrels per acre per year. This same company has 15 wells on a 2.59 acre tract, and at 20 barrels per day per well, this tract will produce 300 barrels per day, or at the rate of over 30,000 barrels per acre per year on a 261-day basis. The entire London Townsite, consisting of 51.41 acres, has 154 wells on it. These wells, producing 20 barrels per day, five days per week, or 261 days per year, would yield 803,880 barrels. This is at the rate of 15,636 barrels per acre per year. In other words, these wells have a per acre yield in one year greater than the combined per acre yield on complainant's lease for eight years.

948 Furthermore, a great many of these areas of dense drilling are in portions of the pool where the productive sands are thin, and the reserves per acre are much less than in complainant's lease, which has nearly 100 feet of sand. If some of these densely drilled areas do not directly drain complainant's properties, nevertheless the total allowable given these numerous wells de-

prives complainant of that much of the daily top allowable which it would otherwise share in, and likewise depletes the reservoir of oil that complainant and others similarly situated could recover, if permitted.

17. The Rowan & Nichols lease involved in this suit is a tract of 24.99 acres, known as the Todd "B" lease, being a part of the William H. Castleberry Survey, in Gregg County, situated in the north central portion of the field in the "fairway" where the oil-saturated sand is thick, and where the porosity and permeability are as high as any in the field. Complainant has drilled five wells on the lease which are all flowing. Everything considered, complainant's wells and lease are far above the average. Indeed, they rank at the very top. To the east and to the west of complainant's lease, along a wide front, there is a gradual change in oil-saturated sand thickness to the edges of the field where it becomes zero. On the whole, in a very large area around complainant's lease, the drilling is more dense than on complainant's lease; consequently, the relative allowables per acre, or on basis of reserves, are higher than the allowables granted to complainant's property. Again, though complainant has average drilling density for the field, 1 well to about 5 acres, the property is far superior to average on almost any comparison. R. M. Wood obtained a permit to drill a well on what is contended by the respondents to be one acre, but by complainant to be 1/10th of any acre, immediately adjacent to complainant's lease on the south. There is no evidence to the effect that the Commission required or attempted to require unitization, and after the Wood well was drilled, it was given the same allowable as the best of complainant's wells. It was estimated that the complainant's tract originally had a recoverable reserve of 60,000 barrels per acre. At the present time, it has been estimated to have about 46,000 barrels per acre. At the

present time, the proof shows that there is left in the entire field or reservoir some 2,217,980,000 barrels of recoverable oil. There is estimated to be under complainant's lease at the present time some 1,151,166 barrels. Complainant's allowable is 111.83 barrels per day. Producing 365 days a year, it would take complainant 28.1 years to recover its oil under the present plan. Producing five days a week, as at present, it would take 39.3 years to recover its oil, whereas the rest of the field, producing 365 days a year, would recover all the recoverable oil within 11.35 years. The field, operating on a five-day a week basis, would be completely dissipated at the end of 16.25 years. Taking the ratio that the recoverable oil under complainant's land bears to the recoverable oil under the entire field, its fair share of the daily allowable would be 235 barrels, using Rowan's estimate of the thickness of the sand at 100 feet, or using his engineer's most conservative estimate of 95 feet, it would be 220 barrels a day. Under any reasonable plan of allocation, which the Court cannot prescribe, and using the proper factors, this allowable may vary a little one way or the other. Complainant's lease is situated ideally in the field in what is called the "fair-way", or the best part of the structure, and, under open flow conditions, it would have a very distinct advantage over both the west and east sides. If complainant had been permitted to produce that proportion of the daily allowable that its reserves bear to the reserves of the field, it would have recovered 200,000 barrels, which under the present order it has not been permitted to produce. For some seven years now complainant has been before the Railroad Commission, seeking an adjustment in allowable, and has filed several law suits and has to resort to the Courts to obtain the right to drill two of its five wells. For that matter, with three wells, it already had sufficient wells to produce its fair share of the oil without drill-



ing the two additional wells, which it was forced to drill at a cost of about \$10,000.00 a well, or else not receive the allowable which was assigned to such wells. Should complainant be required to drill more wells to get a higher allowable, it would be required unnecessarily to make such an investment, as it already has enough wells. Indeed, it has more than enough.

Wood took possession of and drilled a well on a tract which complainant claimed was a part of its lease, about the 22nd of August, 1937, at which time complainant had been producing oil from the tract for about six years. After complainant had contested the Wood permit, with other operators, it filed application for adjustment in allowable, and, alternatively, asked for some twenty permits, stating, however, that it sought the permits only in the event it was not entitled to an adjustment in allowable, and that if the latter relief was inconsistent with the former, then to consider it withdrawn. One permit was granted by the Railroad Commission as an offset, but the application for adjustment in allowable was held in abeyance by the Commission for several months, and has not yet been acted upon. In the meantime, this suit was filed. The additional sixth well is not necessary to prevent waste nor to permit complain-

951      ant to recover the oil underneath its tract or its fair share of the oil, and although it would have given complainant a density greater than its neighbors, at the rate permits were being granted the first five months of this year, to-wit, 760, it is reasonable to assume that complainant would have found itself in the same plight again within a short time. The complainant exerted every reasonable effort to obtain an adjustment in allowable, and its situation with reference to drainage was becoming more aggravated monthly, due to the numerous additional wells that were being drilled and being assigned as much as 20 barrels per day regardless of reserves or drilling density.



18. The respondent Commission's monthly proration orders have adopted the same basis for restriction, to-wit, an hourly potential, as determined by the Commission, and by ignoring complainant's applications and protests and by never having passed on its application for an adjustment in allowable, filed February 24, 1938, the Commission has demonstrated that it intends to maintain the present method of distribution, which is approximately 99% well basis and approximately 1% allocated on potential.

19. Studies have been made of the East Texas field sufficient to form what are regarded by petroleum engineers and oil operators as accurate estimates of the oil reserves throughout the field. The same is true of the Rowan & Nichols lease. The factors to be taken into consideration in making such estimates are: (1) acre feet of sand, (2) the porosity and saturation of the sand, (3) the permeability, (4) the pressure, and (5) whether or not there is gas in solution. Numerous cores have been taken throughout the field which reflect much of this information. The average porosity in the field is somewhere between 24 and 26%. There are found streaks of tight, less porous sand, and then streaks of porous sand in the same well, but the average weighted variation

952 runs very nearly 24%. There are not available as many permeability determinations as core determinations, but where there are lacking permeability determinations from cores, it can be readily determined from reservoir pressures, so that the engineers are equally as well fortified as to information with reference to permeability. Surveys have been made whereby it has been very definitely determined where the top and the bottom of the sand are, and sand thickness maps have been made since December, 1932. Pressures are known because the Railroad Commission makes monthly pres-

sure checks, and there is available more pressure information on the East Texas field than nearly any other field in the world. The Bureau of Mines has determined at what pressure the gas in solution will pass out of solution, and it is generally recognized that the violent point is around 575 pounds. All of this information has been made available to the Railroad Commission. There is nothing in the present plan of proration based on potentials that takes into account in any way the difference between the oil reserves under the complainant's 25-acre tract and the oil reserves under the Wood tract or any other tract. There is likewise no factor in the existing proration order, in its application to the East Texas field, that takes into account the respective oil reserves under the various tracts, so as to allow each to produce oil substantially in proportion to the recoverable oil under them, nor is there anything in the order or its application which takes into consideration the relative rights of operators to produce their fair shares of the oil. Neither the order nor its application entitles the owner of leases, or gives the owners of leases in the field, an equal opportunity to realize upon the known recoverable oil reserves of their respective leases. This method of proration results in denying to complainant an opportunity to produce its fair share of the oil, and gives to others 953 an opportunity to produce more than their fair shares of the oil and to drain oil from complainant's lease—oil which complainant would produce if given an opportunity to produce its fair share of the allowable, and twice its part of the daily allowable. In the evaluation of properties in the field, engineers generally use substantially the same formula in determining or ascertaining the recoverable oil reserves under a particular tract of land. One of the witnesses for the respondents has prepared sand maps for several years and has made estimates of recoverable reserves on the basis thereof. The Railroad Commission at one time embraced

in its orders the factor of sand thickness and also bottom hole pressure. The only phase of the present order which relates to the prevention of waste is the top allowable, and, therefore, any reasonable plan of allocation could be resorted to by the Commission just as effectively or more so than the present plan in the prevention of waste, due to the numerous densely drilled areas in the field, which cause low pressure areas, and a per well plan of proration is most likely to continue and aggravate these low pressure areas. The present plan of per well allocation causes unnecessary waste on the west side by reason of the excessive withdrawals of water, and therefore, the dissipation of the reservoir energy. If some of these wells were even closed in, the oil would migrate east and would ultimately be recovered by other operators without the necessity of excessive water withdrawal and the unnecessary dissipation of the lifting energy. Exhibit 8 shows the top of the Woodbine sand, Exhibit 9 shows the water table, and Exhibit 10 shows the thickness of the sand in the field. Schlumberger tests, which are electrical logs taken of wells, indicate the porosity, thus showing shale sections and water. Numerous of these tests have been taken throughout the field,

954 and there was no satisfactory reason shown by the Commission as to why it could not have the advantage of them. The accuracy of these logs is generally conceded. There are numerous plans that could be adopted that would create less waste and that would more reasonably allocate the allowable on the basis of giving each operator an equal opportunity to produce or recover his fair share of the oil or the oil underlying his tract. Even conceding that the potentials as now used by the Commission are accurate, mere acreage could be multiplied by potential and the allowable allocated on a more reasonable basis, which would give complainant at least 50 barrels more per day from its lease than it is now permitted to produce, but still not enough.

20. The relation of complainant's lease to the field in general may be illustrated by the following table submitted by complainant, and substantiated by the evidence in the case:

	East Texas Field.	Complain- ant's Lease	Per Cent of Total
Average Sand Thick- ness .....	42	95	.....
Acre Feet .....	5,586,000	2,374	.04219
Density .....	5.1333	5.00	.....
Well Production to 1 1 39 <sup>0</sup> .....	1,304,730,000	355,254	.027228
Total Potential .....	15,667,543	4,820	.03076
Average Potential .....	605	964	.....
Present Allowable .....	522,591	112	.02143

It is not disputed that the average oil saturated sand thickness in complainant's lease is over 95 feet. Hundreds of leases, covering thousands of acres, have 30 feet or less. The average for the field is 42 feet. Therefore, complainant's lease has some 50 feet above the average. The significance of these figures becomes apparent when it is realized that, as is well known, many prolific fields do not have as much as 50 feet of sand. The orders of the Commission do not take into account the advantage which complainant has over others in having the maximum of oil saturated sand.

955 21. The difference between almost the poorest wells in the field that will only produce 20 barrels daily and wells like complainant's, which rank with the best in the field, is only 5 barrels. The production allocated to the wells is as follows:

21,179 wells produce about 20 barrels, or a total of 423,580 barrels.

2,000 wells produce about 21 barrels, or a total of 42,000 barrels.

1,831 wells produce about 22 barrels, or a total of 40,282 barrels.

319 wells produce about 23 barrels, or a total of 7,337 barrels.

96 wells produce about 24 barrels, or a total of 2,304 barrels.

22 wells produce about 25 barrels, or a total of 550 barrels.

Complainant's wells are allowed to produce daily, as follows:

Well No.	No. of Barrels
1	22,388
2	22,272
3	22,388
4	22,504
5	22,272

22. The practical effect of the order and the restriction which is imposed, is to allow complainant to produce from its lease at a rate slightly in excess of 4 barrels per acre per day, while, for instance, Wood, on the adjoining tract, is allowed to produce 220 barrels per acre per day, if he owns 1 10th of an acre, or 22 barrels per acre per day if he owns 1 acre. This condition is true in numerous places in the field.

23. While the State, or rather the Commission, undertakes to justify the use of mere potential, regardless of other factors, such as size or richness of tract, on the

ground that the limit of error is not so great, if mere potential be used, and on the ground that potential indicates most of the factors anyhow, such line of reasoning defeats itself. In effect, the Commission contends that, if there are two adjoining tracts, one of 10 acres with one well, and another of  $1/10$ th of an acre with one well, both with identical potentials (real or calculated), the  $1/10$ th of an acre tract has the same recoverable reserve, and should have the same allowable as the well on the 10-acre tract. Surely it is more reasonable to assume that there is 100 times more recoverable oil in the 10-acre tract than in the  $1/10$ th of an acre tract, and that the size of the tracts should be taken into account. For all practical purposes it is a fact that each acre of the 10-acre tract has 10 times as much recoverable oil as the adjoining  $1/10$ th of an acre tract. The Commission, by its orders and its method of restriction, ignores that fact, by giving the 10-acre tract and the  $1/10$ th of an acre tract the same allowable. As long as such a method of distribution is followed, the owners of large tracts will not recover their fair shares, and will be prevented from recovering their fair shares by the owners of small tracts who are recovering more than their fair shares. The effect of the program thus is to take the oil of one operator and give it to another, even where the potentials are the same. The giving of the same allowable to a good well on a large tract as to a small well on a small tract, increases the inequity.

24. It might be conceded that the potential of a well may give some slight indication of pressure, sand thickness, porosity, permeability, reserves in the area, and even position on structure which has some bearing on recoverable reserves. Witnesses for respondents do not, however, say very definitely how accurate is the information given with respect to each of the factors mentioned. Obviously, if a well produces only a trickle of oil, thereby



having an insignificant potential, while a well on another lease has a high potential, it is evident that the area around the first well does not have the same recoverable reserves as the area around the second well.

957 Beyond doubt, under the assumed facts, there would be indicated a variation or difference in one or more of the following factors which have to do with recoverable reserves: pressure, sand thickness, porosity, permeability, and recoverable reserve around the well. On the other hand, the potential standing alone does not appraise each of these factors separately. For instance, in the first well the lack of potential may be caused wholly by a very thin sand, though pressure, porosity and permeability be very high, or it may have been caused by very low pressure, or simply by very little porosity, or by the method of well completion.

25. To some degree it is true that wells along the extreme east edge of the field and along the west edge of the field will become exhausted before complainant's wells which are favorably situated in the fairway; but, even if this should take place, so that the allowables for wells in the fairway would be increased, it does not follow that complainant would recover its fair share. In the first place, the top of the sand in complainant's lease is lower by some 30 feet than in leases to the east of it; consequently, water will drown out complainant's wells before it drowns out wells further up structure. While it is true that wells on the extreme edge of the field will likely be abandoned before complainant's wells become non-productive, most of the abandonments along the east side of the field will simply be on the edges, and the number will not be considerable. It is rank speculation to say that to the east of complainant's tract wells having 20 feet or more of sand will be abandoned before water drowns out complainant's wells. It does not at all follow, as implied by the State, that the aban-



donment of wells along the east and west edges will naturally increase the allowable for the remaining wells in the field, including complainant's.

In 1938 the abandonments totaled 207, but new permits totaled 1,771. It is unwarranted speculation to assume that the present allowable for the field will be continued when the field becomes much smaller as the result of water encroachment. In view of pressure declines, gas coming out of solution, and water production becoming greater, the probabilities are that in the later stages of the producing life of the field it will not be permitted to produce as much as 500,000 barrels of oil per day, so there is no assurance whatever that the allowables for complainant's wells will be increased in the years to come by the application of the present proration formula. Indeed, if we are to speculate, it should be to assume that, absent some compulsion exerted on the Commission, the per-well allowable will be continued, and complainant will in the future be substantially in the same comparative position as it is at the present time, having much less than its fair share. Furthermore, areas to the east of complainant's wells are more densely drilled than is complainant's lease. If complainant is entitled to its fair share of the oil, it is also entitled to its fair share of the energy; and therefore, it should be permitted to produce its fair share of the oil by flowing, rather than waiting until the energy is dissipated and being required to pump its oil, which is a much more expensive process.

26. It appears that a line drawn north and south approximately through the center of the field is a line dividing properties into two classes. Under the present method of distribution, properties west of this line will recover less than the amount of recoverable oil which was originally underneath such properties, while properties to the east of the line will recover more than was orig-

inally under the properties. Complainant's lease is a short distance west of the maximum recovery line; consequently, under the present plan of proration, it will not even be permitted to recover a total amount equivalent to the original reserves which were under the tract, much less any additional amount which would be recoverable by virtue of structural position. It follows, of course, that it is not given the advantage of its structural position with respect to properties to the west of it. The present plan of proration, being really on a per-well basis, has the effect of taking oil from complainant and giving it to owners of wells and properties less favorably situated and having far less recoverable oil in their lands. Many operators situated similarly to complainant, and many less favorably situated in all respects, are given advantages when reserves or potential are considered, also position on structure, even if time be taken into account. It is clear, therefore, that, under the present plan or one similar to it, the time element will not give an opportunity to complainant to recover its fair share of the recoverable oil in the field. Furthermore, there appears to be no necessity to permit many operators to recover in a reasonably short time their shares of the recoverable oil, while complainant must continue to suffer loss an indefinite but great number of years in order to enjoy its property which is one of the best in the field. Even under the most favorable assumptions, an unreasonable time will have passed before there will be even a probable opportunity for complainant to recover even a substantial part of its fair share of the reserves of the field.

27. Several methods of distribution have been suggested which, if adopted, would minimize the inequities and reasonably avoidable drainage resulting from the present method of distribution. One witness suggested a method based on acre feet of sand thickness, with a

correction factor for bottom hole pressure. The same factors formerly used by the Commission, but giving each the proper percentage, would not only be fairer, but would be more conducive to the prevention of waste, and in adopting such plan, the witness suggested that a minimum should be given to tracts, rather than wells, in view of the large number of unnecessary wells drilled. It was not shown that any effort was made to unitize these numerous small tracts, which would be in aid of any plan. Numerous plans are well known to the Commission and its engineers; they are workable and easy of administration. Beyond question, many factors may properly be considered other than real potentials, or in connection with real potentials, such as sand thickness, surface area, recoverable reserves, pressures, and location on structure. Practically every engineer and geologist familiar with the East Texas field, as well as the Railroad Commission, by estimating the recoverable reserves in the East Texas field, must have determined the acre feet of saturated sand in the reservoir; otherwise, no such accurate estimate could have been made. Any formula which gives consideration to the recoverable oil or reserves under any lease should properly take into consideration acre feet of saturated sand or its equivalent. It is obvious that a proper method of distribution must take into account the size of the tract upon which each well is situated, or stated differently, must take into account drilling densities. Various methods of distribution can be devised which will be fair to all, and will give to complainant an opportunity to produce its fair share of the oil without being required to drill unnecessary wells to obtain such share.

28. There are a number of pumping wells in the field which have for some time been producing relatively small amounts of oil, but some of them producing more than is necessary to prevent their premature abandonment.

There are 451 wells which are unable to make as much as 20 barrels per day. These are assumed by 961 the complainant and the Commission to be marginal wells, as defined by law (Article 6049b, Vernon's Texas Civil Statutes). The other pumping wells in the field are capable of producing more than 20 barrels per day for more than 30 consecutive days, and no loss of production ultimately recoverable, and no damage to the wells, and no premature abandonment of wells would occur if such wells were artificially restricted below 20 barrels per day. The 451 wells average about 11 barrels a day or a total of approximately 5500 barrels a day, or  $1\frac{1}{4}\%$  of the total daily allowable, and only about  $1\frac{1}{4}$ th of what any one of Rowan & Nichols Oil Company's wells could produce in one day. A considerable number of wells in the field are being pumped profitably at the rate of about 5 barrels per day, and the Commission's schedule shows that some wells are operating at substantially less than 5 barrels a day. The production from the 451 wells represents a small factor in the ultimate recovery of this vast field.

From the standpoint of waste, none would occur if many wells in the field were actually shut in, or were allowed to produce as little as 5 barrels per day, though it might be advisable, in order to void paraffin trouble, to produce such wells' average allowable every other day, or once in three or four days, rather than on each day. Furthermore, it is not at all conclusive that any substantial reserves lying around these wells will be ultimately lost even if they should be plugged. Their reserves would be produced by other wells. Moreover, it is indicated that the production of many of these wells, with the large amount of water that is brought up with the oil, is even more harmful and wasteful to the field than the abandonment of those wells themselves would be. The oil that most of them would fail to recover by

962 being abandoned would be recovered by other wells. The cost of pumping equipment in the field is approximately \$3,500.00 per well. The price of oil in the East Texas field for about five months prior to the trial of this case has been \$1.10 per barrel. For a long time previous, it was \$1.35 per barrel. Some 4,122 wells have been drilled since January 1, 1937, although the field at that time had an average density of more than 1 well to 10 acres and although the effect of Rule 37 is a finding that one well to 10 acres is a proper spacing regulation in prevention of waste to recover the recoverable oil under said field. It is clear that a reasonable profit above normal operating expenses can be made from a well in the East Texas field producing 5 barrels per day. Obviously, the expense of production from a flowing well is not as great as that of producing a pumping well.

29. The parties hereto admit that for the purpose of waste prevention the top allowable for the field should not materially exceed approximately 500,000 barrels a day. If that allowable be distributed on a reasonable basis, then the better wells and properties will, on the average, receive far more than 20 barrels each, and the poorer wells and properties, on the average, will receive substantially less than 20 barrels each. It would be more accurate to say that operators with larger recoverable reserves would have relatively higher allowables than operators with much smaller recoverable reserves. By such a fair and reasonable method of distribution, the Commission would prevent waste by limiting the field to approximately 500,000 barrels per day and would also avoid the taking of the property of one operator for the benefit of another. There is nothing in the marginal well statute or any other statute which prohibits such a program.

30. Generally speaking, waste is prevented in the East Texas field by maintaining a relatively low top allowable and distributing that allowable in such a way that there will not be heavy or concentrated production in localized areas which would tend to cause relatively low pressure areas and to pull in water abnormally. Any of the methods of distribution of such a top allowable which gives to complainant and others the opportunity to receive their fair shares of the allowable would not create as much waste as does the present method of distribution, but, on the contrary, some of the other methods suggested would have a tendency to reduce waste now existing, for, under a per well method of distribution, low pressure areas and premature and damaging water encroachment are likely to occur, where wells are dense, as at Gladewater, London, Kilgore, and elsewhere.

31. The original order, passed in 1933, based on potentials actually taken at the time, allocated the production on the basis of 15% of the hourly potential. There were some 8,000 wells at that time. In the meantime, the wells have practically trebled, and the allowable percentage has been decreased to 2.32%, though, as stated, few wells are actually restricted to 2.32% of their true, or even comparative potentials. The field allowable has likewise been substantially decreased, to-wit, more than 50%, from approximately 750,000 to 375,000 average per day. The continued drilling has therefore operated to make this system of proration progressively more oppressive until the field is again on a per well basis. The potential factors of the order have practically become nil. Complainant has constantly protested to the Commission with regard to the order, without result. It appeared in the Courts, protesting same, and subsequent to the decision in Brown vs. Humble, complainant again protested to the Commission. Although its last application for an adjust-



ment in allowable was filed February 24, 1938, it has not yet been finally refused or granted by the Commission, at least by any specific ruling, except that the Commission, by its monthly orders and allowables, has continued to fix the same comparative allowables, making no adjustment. This suit was filed in September, 1938. Furthermore, complainant has attempted to relieve itself by applying alternatively for permits to drill additional wells, however unnecessary they might be in the production of its property, without relief.

### CONCLUSIONS OF LAW.

1. The orders of the Commission, as they are interpreted, applied and enforced as to complainant, do not allocate or distribute the allowable "on a reasonable basis," as required by the statute, and operate to confiscate complainant's property contrary to the due process and equal protection clauses of the Fourteenth Amendment to the Constitution of the United States, and are void as so interpreted, applied and enforced.

2. The method of distribution under the orders attacked by complainant, as applied and enforced as to complainant, denies to complainant the opportunity to recover ultimately, much less within a reasonable time, an amount of oil in the proportion that the recoverable reserves which were originally under its lease bear to the recoverable reserves in the field.

3. The method of distribution adopted by the Commission, as applied and enforced as to complainant, does not give complainant the opportunity to produce ultimately, much less within a reasonable time, an amount of oil which would be recovered if, at the time of each proration order, the allowable should be fixed for complain-



ant's property substantially in the proportion that the recoverable oil in its lease at that time bore to the recoverable oil in the field.

4. The method of distribution adopted by the Commission does not, as it is enforced and applied to complainant, give to complainant an opportunity to recover the oil underlying its tract of land.

965 5. Complainant cannot be required to resort to the confiscatory method of drilling additional and unnecessary wells to recover its fair share of the recoverable oil in said field or to recover the oil underneath its tract.

6. The application and enforcement of said orders and method of restriction under attack by complainant are void as to complainant in that the denial to complainant of the equal opportunity to produce presently, and not at some time in the distant future, its fair share of the oil in said field, is confiscatory and therefore void.

7. The applicable part of the marginal well statute reads as follows:

"Art. 6049 b: Marginal wells defined; curtailing production.

"Sec. 1. The term 'Marginal Well' as used herein means a pumping oil well capable, under normal unrestricted operating conditions, of producing such daily quantities of oil as herein set out as would be damaged, or result in a loss of production ultimately recoverable, or cause the premature abandonment of same, if its daily production were artificially curtailed. The following described wells shall be deemed 'Marginal Wells' in this State:

"(b) Any pumping oil well within this State having a daily capacity for production of twenty (20) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a horizon deeper than two thousand (2,000) feet and less in depth than four thousand (4,000) feet." \* \* \*

There is nothing in the marginal well statute or any other statute which forbids the Commission from restricting non-marginal wells below the limit applicable to true marginal wells as defined by statute. Reducing the allowable of wells to 5 barrels a day will not cause abandonment of the wells, loss of production ultimately recoverable, or damage any property or well. If the statute be interpreted to mean, as the Commission seems to think,

966 that the Commission cannot restrict non-marginal wells in the field below 20 barrels, then as long as the top allowable is not more than about 525,000 barrels a day, virtually all of the wells, good and bad, are given substantially the same allowable, resulting in unnecessary confiscation of complainant's property, and either the statute or the program of restriction to about 525,000 a day must fall. The parties admit that for the purpose of waste prevention the top allowable for the field should not materially exceed approximately 500,000 barrels a day. If that allowable, less the small amount produced by the true marginal wells, be distributed on a fair basis as outlined herein, then the better wells will on the average receive substantially more than 20 barrels each, and the poorer wells, on the average, will receive substantially less than 20 barrels each. It would be more accurate to say that operators with larger recoverable reserves would have relatively substantially higher allowables than operators with smaller recoverable reserves. By such a fair method of distribution, the Commission would perform its statutory duty of preventing waste by limiting the field to approximately 500,000 barrels per day

and would also avoid the taking of the property of one operator for the benefit of another. There is nothing in the marginal well statute or any other statute which prohibits such a program, so the Commission has acted arbitrarily and without justification in refusing to distribute the allowable in a manner to give complainant the opportunity to produce its fair share.

It is apparent that the effect of the so-called "statutory marginal wells," producing only about 5,500 barrels a day, is very slight as far as the general scheme of proration for the East Texas field is concerned. In any event, the marginal well statute offers no excuse for a flat 20 barrels allowance to other wells whose potentials run from practically zero to 860 barrels an hour.

Done at Austin, Texas, this 7th day of August, 1939.

ROBERT J. McMILLAN, Judge.

967 Findings of Fact and Conclusions of Law. Filed August 7, 1939.

968

## STIPULATION.

(Title Omitted.)

It is stipulated that upon the trial of the above entitled and numbered suit evidence was offered to establish, among others, the following facts:

1. The total daily allowable for the East Texas Field as fixed by the Railroad Commission order in force at the time of trial was about 522,500-barrels of oil.

2. The order promulgated by the Railroad Commission and in force at the time of trial for the proration of this field allowable among the wells in the field provided: "the owner or operator or manager of each well in the East Texas Field shall be permitted, either collectively or individually, to produce daily from each well a maximum of two and thirty two hundredths (2.32) per cent of its hourly potential capacity as determined by the Commission."

3. In the application and enforcement of the above proration order (a) each well that could not produce as much as 20-barrels of oil per day was allowed to produce the maximum amount that it could produce; (b) where 2.32% of the hourly potential of any well would amount to less than 20-barrels per day, the well was allowed to produce 20-barrels of oil per day; (c) where 2.32% of the hourly potential of any well would amount to more than 20-barrels of oil per day, such well was allowed to produce 2.32% of its hourly potential.

969. This application of the order resulted in the following: Approximately 451-wells, not any one of which was capable of producing as much as 20-barrels per day, were allowed to produce daily a total of approximately 5,250-barrels. Approximately 19,032-wells whose individual hourly potential when multiplied by 2.32% amounted to less than 20-barrels, were each allowed to produce a full 20-barrels per day; or from all of such wells a total of approximately 380,640-barrels per day. These were wells whose hourly potential ranged anywhere from 1-barrel to 860-barrels per hour. Approximately 6,325-wells whose individual potential when multiplied by 2.32% amounted to more than 20-barrels were each allowed to produce daily that number of barrels which equaled the product of its hourly potential multiplied by 2.32%. The total daily production from these

wells was approximately 136,610-barrels. These wells had an hourly potential ranging from 865-barrels per hour to about 1,100-barrels per hour. In practical operation, the daily allowable of no well was controlled by the factor 2.32% of its hourly potential unless such well had a potential of 865-barrels or more per hour.

The plaintiff offered testimony to show that if each well in the field that could not make 20-barrels per day was allowed to produce the maximum which it was capable of producing, and if every well in the field that was capable of making 20-barrels per day was allowed to produce 20-barrels per day, that the aggregate of such production amounted to some 510,000 or 515,000-barrels of the daily allowable of approximately 522,500-barrels, with the result that only about 7,000 to 12,000-barrels of the total daily production was in the practical application of the order of the Commission prorated on the factor of 2.32% of the hourly potential of the wells.

4. The testimony shows that the wells were shutdown on Saturdays and Sundays and were allowed to produce only five (5) days each week and the figures 970 referred to in the testimony were for the days on which the wells were allowed to produce.

Witness Our Hands this the 16th day of May, 1939.

RICE M. TILLEY,

DAN MOODY,

Attorneys for Plaintiff,

JAMES P. HART,

D. D. MAHON,

Attorneys for Defendants.

Stipulation. Filed 17th day of May, 1939.

## 971 REQUEST FOR PARTIAL RECORD.

(Title Omitted.)

To the Clerk of said Court:

The Railroad Commission of Texas and Lon A. Smith, Ernest O. Thompson and Jerry Sadler, the Members of the Railroad Commission of Texas, and Gerald C. Mann, Attorney General of Texas, respondents in the above entitled and numbered cause, being desirous to docket the appeal in this cause in order to make in the United States Circuit Court of Appeals for the Fifth Circuit a motion for a stay pending appeal, request the Clerk of this Court to certify and transmit to the United States Circuit Court of Appeals for the Fifth Circuit a copy of a portion of the record and proceedings in this cause needed for such purpose, to-wit:

1. Complainant's original bill of complaint.
2. Amendment to complainant's bill of complaint.
3. Respondents' amended answer.
4. Opinion of the Court dated June 12, 1939.
5. Final judgment of the Court entered on June 14, 1939.
6. Respondents' motion for stay pending appeal.
7. Order of the Court dated June 14, 1939, denying stay pending appeal.

972 8. Notice of appeal of respondents.

9. Respondents' appeal bond.

GERALD C. MANN,  
Attorney General of Texas,  
JAMES P. HART,  
Assistant Attorney General,  
D. D. MAHON,  
Assistant Attorney General,  
HARRY S. POLLARD  
Attorneys for Respondents.

Address: State Capitol,  
Austin, Texas.

#### Proof of Service.

Service of the foregoing request was made by delivering a copy thereof to Susette Meyer, at the office of Dan Moody, one of the attorneys for complainant, in the Norwood Building, Austin, Texas, at 4:04 o'clock P. M., on the 19th day of June, 1939.

JAMES P. HART,  
Attorney for Respondents.

Filed 19th day of June, 1939.

973

#### MOTION FOR JUDGMENT.

(Title Omitted.)

To the Honorable Judge of said Court:

Come now the defendants in the above entitled and numbered cause, after the plaintiff has rested its case,



and moves the Court to enter judgment in favor of defendants.

GERALD C. MANN,  
Attorney General of Texas,  
JAMES P. HART,  
Assistant Attorney General,

State Capitol, Austin, Texas.

D. D. MAHON,  
Assistant Attorney General,  
HARRY S. POLLARD  
Attorneys for Defendants.

Filed 8th day of February, 1939.

974

# STIPULATION AS TO RECORD.

(Title Omitted.)

## I.

Pursuant to the provisions of Rule 75(f) it is stipulated by the parties to this action that the following parts of the record, proceedings and evidence shall be included in the record on appeal:

(1) The parts of the record heretofore certified by the clerk of this Court in a partial transcript of record certified on the 20th day of June, 1939, to-wit:

- (a) Complainant's Original Bill of Complaint.
- (b) Amendment to Complainant's Bill of Complaint.

- (c) Respondents' Amended Answer.
- (d) Opinion of the Court dated June 12, 1939.
- (e) Final Judgment of the Court entered on June 14, 1939.
- (f) Respondents' Motion for Stay pending Appeal.
- (g) Order of the Court dated June 14, 1939, denying Stay pending Appeal.
- (h) Notice of Appeal of Respondents.
- (i) Respondents' Appeal Bond.
- (2) The stenographic statement of the evidence in question and answer form, certified by John Waide, Court Reporter, on August 1, 1939.
- 975 (3) Findings and conclusions of the Court.
- (4) Stipulation of the parties, filed May 17, 1939.
- (5) Appellants' request for partial record, filed June 19, 1939.
- (6) Motion of respondents for judgment, filed February 8, 1939.
- (7) Stipulation of the parties as to the record.
- (8) Order of the Court directing the transmittal of original papers and exhibits to the Circuit Court of Appeals for the Fifth Circuit.

(9) Order of the Court dated June 28, 1939, extending the time for filing the record on appeal and docketing the action.

## II.

It is further stipulated by the parties that the following papers and exhibits may be transmitted to the Circuit Court of Appeals for the Fifth Circuit for inspection:

Exhibits 7, 8, 9, 10, 11, 12, 19, 20 and 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 38, 39 and 40.

Witness our hands at Austin, Texas, this 8th day of August, 1939.

DAN MOODY,

Attorney for Complainant,

JAMES P. HART,

Attorney for Respondents.

Filed 9th day of August, 1939.

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### ORDER OF COURT DIRECTING CLERK TO TRANSMIT CERTAIN ORIGINAL EXHIBITS TO CIRCUIT COURT OF APPEALS.

976

(Title Omitted.)

It appearing to the Court that the parties to this action have stipulated that the original papers and exhibits hereinafter named should be transmitted to the United States Circuit Court of Appeals for the Fifth Circuit, and it further appearing to the Court that such original papers and exhibits should be inspected by said Appellate Court

and should be sent to said Appellate Court in lieu of copies,

It is Ordered that the Clerk of this Court shall transmit to the United States Circuit Court of Appeals for the Fifth Circuit the following original papers and exhibits introduced upon the trial of this action, to-wit:

Exhibits 7, 8, 9, 10, 11, 12, 19, 20, and 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 38, 39 and 40.

Done at San Antonio, Texas, this 10th day of August, 1939.

ROBERT J. McMILLAN,  
District Judge.

Filed 11th day of August, 1939.

### ORDER EXTENDING TIME FOR FILING RECORD ON APPEAL.

977 (Title Omitted.)

Respondents having requested the Court to extend the time for filing the record on appeal and docketing this action in the United States Circuit Court of Appeals for the Fifth Circuit, and it appearing to the Court that notice of Appeal dated June 19, 1939, has been filed by respondents, and that September 16, 1939, is less than ninety days from the date of the notice of appeal,

It is Ordered that the time for filing the record on appeal and for docketing this action in the United States Circuit Court of Appeals for the Fifth Circuit is extended until September 16, 1939.

Entered at San Antonio, Texas, this 28th day of June, 1939.

ROBERT J. McMILLAN,  
United States District Judge.

Filed June 28, 1939.

978

## CLERK'S CERTIFICATE.

The United States of America,  
Western District of Texas. ss.

I, MAXEY HART, Clerk of the United States District Court in and for the Western District of Texas, do hereby certify that the foregoing on 977 pages, contained in five (5) volumes, numbered one (1) to five (5), respectively, (every volume being identified by my official signature on the last page thereof), is a true and correct transcript of the final portion of the proceedings had and orders entered, as therein stated, in Cause No. 624 In Equity, styled Rowan & Nichols Oil Company versus Railroad Commission of Texas, et al., as the same appear on file and of record in this office.

I further certify that the transcript embraces only such pleadings, process and orders as are specified in the Stipulation as to Record filed herein.

Witness my official signature and the seal of said District Court, at office in the City of Austin, Texas, this the 25th day of August, A. D. 1939.

MAXEY HART,

(Seal)

Clerk of said Court.

By J. F. CAROLINE, Deputy.

[fol. 1005] That thereafter the following proceedings were had in said cause in the United States Circuit Court of Appeals for the Fifth Circuit, viz.:

ARGUMENT AND SUBMISSION

Extract from the Minutes of October 2nd, 1939

No. 9173

RAILROAD COMMISSION OF TEXAS, ET AL.

VERSUS

ROWAN & NICHOLS OIL COMPANY

On this day this cause was called, and, after argument by James P. Hart, Esq., Assistant Attorney General of Texas, for appellants, and Dan Moody, Esq., for appellee, was submitted to the Court.

[fol. 1006] OPINION OF THE COURT—Filed November 3, 1939

IN THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE FIFTH CIRCUIT

No. 9173

RAILROAD COMMISSION OF TEXAS, ET AL., Appellants,

VERSUS

ROWAN & NICHOLS OIL COMPANY, Appellee

Appeal from the District Court of the United States for the Western District of Texas

(November 3, 1939)

Before Foster, Sibley and Holmes, Circuit Judges

FOSTER, Circuit Judge:

This suit was brought by Rowan and Nichols Oil Co., owner of an oil lease in the East Texas Field, hereafter referred to as plaintiff, to enjoin the Railroad Commission of Texas, hereafter referred to as the Commission, its members

and the Attorney General of Texas, from enforcing against plaintiff an order issued by the Commission, on August 29, 1938, and subsequent amendments, fixing the amount of crude oil permitted to be produced daily from the East Texas Oil Field, usually referred to as the "allowable", and prorating production as to the wells in the field. The [fol. 1007] orders fixed the total allowable at about 522,500 barrels a day and restricted each well to daily production of 2.32 per cent of its hourly potential production. Plaintiff did not challenge the authority of the Commission to enter the order nor attack the top daily allowable. The bill alleged the order as interpreted and enforced by the Commission was unreasonable, arbitrary and confiscatory of plaintiff's property, without due process of law, in violation of the 14th Amendment. The bill prayed for an interlocutory injunction. By amendment this was waived and the case was tried before the District Judge, sitting alone. There was judgment for plaintiff. 28 F. Supp. 131. This appeal followed.

The District Court made extensive and comprehensive findings of facts, which were not excepted to. It is unnecessary to review them all. The case may be substantially stated as follows.

The East Texas Oil Field is approximately 40 miles in length from north to south with an average width of 4 miles from east to west. It lies in Upshur, Gregg, Smith and Rusk Counties, and it is of about 133,000 acres in surface extent. It has produced oil continuously since its discovery in October, 1930. The oil is in a continuous, common reservoir about 3600 feet below the surface, contained in what is called the Woodbine sand.

The average depth of the Woodbine sand throughout the field is 42 feet. On a line drawn through the centre of the field from north to south, which is called the fairway, the average depth of the Woodbine sand is about 100 feet. Plaintiff is the owner of an oil lease, known as the Todd B. Lease, covering 24.99 acres in Gregg County. It is located in the fairway. The average depth of oil bearing sand under the lease is 95 feet. It was estimated that at the time of suit the entire recoverable oil in the field was 2,217,980,000 barrels [fol. 1008] and the recoverable oil under plaintiff's lease was 1,151,168 barrels.

Plaintiff has five wells on its lease with a potential capacity of about 20,000 barrels per well per day. Under the order complained of each of its wells is allowed to produce



a little over 22 barrels of oil a day, a total of 112 barrels. Orders of the Commission require all wells to be shut down on Saturdays and Sundays leaving five productive days a week.

Plaintiff made application to the Railroad Commission for permission to drill a number of additional wells on its lease but was granted permission to drill only one. It costs about \$10,000 to drill a well in the East Texas Field. The well has not been drilled. As to the enforcement of the order the parties have stipulated as follows:

"In the application and enforcement of the above production order (a) each well that could not produce as much as 20-barrels of oil per day was allowed to produce the maximum amount that it could produce; (b) where 2.32% of the hourly potential of any well would amount to less than 20-barrels per day, the well was allowed to produce 20-barrels of oil per day; (c) where 2.32% of the hourly potential of any well would amount to more than 20-barrels of oil per day, such well was allowed to produce 2.32% of its hourly potential.

"This application of the order resulted in the following: Approximately 451-wells, not any one of which was capable of producing as much as 20-barrels per day, were allowed to produce daily a total of approximately 5,250-barrels. Approximately 19,032-wells whose individual hourly potential when multiplied by ~~2.32%~~ amounted to less than 20-barrels, were each allowed to produce a full 20-barrels per [Vol. 1009] day; or from all of such wells a total of approximately 380,640-barrels per day. These were wells whose hourly potential ranged anywhere from 1-barrel to 860-barrels per hour. Approximately 6,325-wells whose individual potential when multiplied by 2.32% amounted to more than 20-barrels were each allowed to produce daily that number of barrels which equaled the product of its hourly potential multiplied by 2.32%. The total daily production from these wells was approximately 136,610-barrels. These wells had an hourly potential ranging from 865-barrels per hour to about 4,100-barrels per hour. In practical operation, the daily allowable of no well was controlled by the factor 2.32% of its hourly potential unless such well had a potential of 865-barrels or more per hour.

The 451 wells referred to in the stipulation as allowed to produce all they can may properly be classed as marginal

wells under the terms of a Texas statute. (Art. 6049-b, Vernon's Civ. Stat.) which, inter alia, defines a marginal well as any pumping well having a daily output of production of 20 barrels or less. The statute prohibits the Railroad Commission from restricting the production of any marginal well as thereunder defined.

Plaintiff concedes that restriction of production and proration is necessary to prevent waste in the East Texas Field. It makes no point as to the 451 marginal wells. Its principal contention is that allowing all other wells with a potential capacity of not over 20 barrels a day to produce all they can is arbitrary, unjustly discriminatory and confiscatory of its property as any other wells in the field drain the oil from under its lease to some extent. By way of comparison it is pointed out, and the facts were so found by the District [fol. 1010] Court, that nearby leases are more closely drilled. One of .48 acres has five wells which produce at the rate of over 200 barrels per acre per day. Another lease has 15 wells on 2.59 acres, which are allowed to produce 300 barrels per day.

The District Court reached the conclusion that the Commission should have considered as essential factors in allocating the daily allowable the depth of sand under each acre and the estimated amount of oil in place. Judgment was entered enjoining the Commission from enforcing the order and from interfering with plaintiff in the daily production of its fair share of the daily allowable fixed by the Commission, which fair share was fixed at the ratio which 220 barrels bear to 522,000 barrels, basing this upon the recoverable oil under plaintiff's lease and the total amount of recoverable oil in the field. This would allow plaintiff to produce approximately 44 barrels of oil per day from each of its wells, about twice as much as under the order as enforced by the Commission.

Under the law of Texas the owner of an oil lease is the owner of the oil in place under the lease. The Commission had authority to regulate the development of the land and production of the oil but must allow the lease owner to produce a fair share of his oil. The findings of facts by the Commission are not conclusive. Its orders must be reasonable and not arbitrary to be valid and any person challenging their legality may resort to the courts for relief. *Brown vs. Humble Oil Co.*, 126 Texas 296; *Gulf Land Co. vs. Atlantic Ref. Co.*, 131 S. W. (2d) 73. Necessarily, when

rights guaranteed by the Federal Constitution are infringed Federal Courts have jurisdiction. *St. Joseph Stock Yards Co. vs. U. S.*, 298 U. S. 38.

Conceding that, as contended by the Commission, the burden to show illegality of the order rested upon plaintiff, we think that burden has been sustained. Under the undisputed [fol. 1011] facts as shown by the record it is plain that the daily allowable of 522,000 barrels, wells operating on a five days basis, would exhaust the entire field in 16 to 17 years, while plaintiff would be permitted to produce only approximately one-half of the oil it owns, in place under its lease, in the same period, losing the other half entirely from drainage by other wells.

There is undisputed evidence tending to show that a pumping well in the field averaging five barrels production a day can be operated with some profit, although the cost of installing pumping apparatus would be about \$3500 a well. It follows that a flowing well producing the same quantity of oil could be operated at a larger profit. Flowing wells producing 20 barrels of oil a day or less could not be considered as marginal wells coming within the mandatory terms of the statute. The Commission is without authority to so class them. It would seem that a more equitable order could be drafted by fixing a lower maximum production for the smaller wells and raising the percentage of potential production allowed. But that is a question to be decided by the Commission as to which the express no opinion.

The Commission contends that fixing the ratio of production for plaintiff was not within the province of the court. Generally, courts passing upon administrative orders are not authorized to substitute their judgment for that of the authority issuing the order and must content themselves with enjoining the operation of the order as made. However, there are exceptional cases in which equity and justice require a court to temporarily do so. *Newton vs. Consolidated Gas Co.*, 258 U. S. 165. In this case the Commission has no just ground of complaint. The judgment in effect restricts plaintiff to the production of 44 barrels of oil per day per well instead of 22 barrels allowed by the order. If [fol. 1012] that were not so plaintiff would be at liberty, with the order enjoined, to produce its full capacity, which would be unfair to other wells in the field still restricted.

We agree with the District Court that in entering an order prorating the amount of oil allowed to be produced from

each well, the Commission should take into consideration the amount of oil in place under the lease as well as other relevant factors and should so administer the order as to allow each lease owner to produce his fair share of the oil from the common reservoir. In order to remove any doubt as to the temporary character of the ratio fixed by the District Court, the judgment will be amended to read "without prejudice to the right of the Commission to enter a reasonable proration order and to fairly enforce it."

As so amended the judgment is  
Affirmed.

[fol. 1013]

# JUDGMENT

Extract from the Minutes of November 3rd, 1939

No. 9173

RAILROAD COMMISSION OF TEXAS, ET AL.,

VERSUS

ROWAN & NICHOLS OIL COMPANY

This cause came on to be heard on the transcript of the record from the District Court of the United States for the Western District of Texas, and was argued by counsel;

On consideration whereof, It is now here ordered, adjudged and decreed by this Court, that the judgment of the said District Court in this cause be, and the same is hereby, amended to read "without prejudice to the right of the Commission to enter a reasonable proration order and to fairly enforce it," and as so amended, that said judgment be, and it is hereby, affirmed;

It is further ordered, adjudged and decreed that the appellants, Railroad Commission of Texas, and others, and the surety on the appeal bond herein, American Surety Company of New York, be condemned, in solido, to pay the costs of this cause in this Court.

[fol. 1014]

Clerk's Certificate.

United States of America,

UNITED STATES CIRCUIT COURT OF APPEALS, FIFTH CIRCUIT

I, Oakley F. Dodd, Clerk of the United States Circuit Court of Appeals for the Fifth Circuit, do hereby certify

that the pages numbered from 1005 to 1013 next preceding this certificate contain full, true and complete copies of all the pleadings, record entries and proceedings, including the opinion of the United States Circuit Court of Appeals for the Fifth Circuit, in a certain cause in said Court, numbered 9173, wherein Railroad Commission of Texas, et al., are appellants, and Rowan & Nichols Oil Company is appellee, as full, true and complete as the originals of the same now remain in my office.

I further certify that the pages of the printed record, Volumes I. and II. numbered from 1 to 1004 are identical with the printed record upon which said cause was heard and decided in the said Circuit Court of Appeals.

In testimony whereof, I hereunto subscribe my name and affix the seal of the said United States Circuit Court of Appeals, at my office in the City of New Orleans, Louisiana, in the Fifth Circuit, this 22nd day of November, A. D. 1939.

Oakley F. Dodd, Clerk of the United States Circuit Court of Appeals, Fifth Circuit. (Seal.)

[fol. 1012] SUPREME COURT OF THE UNITED STATES

ORDER ALLOWING CERTIORARI—Filed March 11, 1940

The petition herein for a writ of certiorari to the United States Circuit Court of Appeals for the Fifth Circuit is granted.

And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to such writ.

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No. 681

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IN THE  
**Supreme Court of the United States**

OCTOBER TERM, 1939

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RAILROAD COMMISSION OF TEXAS, ET AL.,  
Petitioners

VS.

ROWAN & NICHOLS OIL COMPANY,  
Respondent

---

PETITION FOR A WRIT OF CERTIORARI TO  
THE UNITED STATES CIRCUIT COURT OF  
APPEALS FOR THE FIFTH CIRCUIT

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No. \_\_\_\_\_

IN THE  
**Supreme Court of the United States**  
OCTOBER TERM, 1939

RAILROAD COMMISSION OF TEXAS, ET AL.,  
Petitioners

VS.

ROWAN & NICHOLS OIL COMPANY,  
Respondent

PETITION FOR A WRIT OF CERTIORARI TO  
THE UNITED STATES CIRCUIT COURT OF  
APPEALS FOR THE FIFTH CIRCUIT

The Attorney General of the State of Texas, on behalf of the Railroad Commission of Texas and Lon A. Smith, Ernest O. Thompson and Jerry Sadler, Members of the Railroad Commission, and himself, Gerald C. Mann, Attorney General of Texas, prays that a writ of certiorari issue to review the judgment of the Circuit Court of Appeals for the Fifth Circuit entered in the above case on November 3, 1939, affirming the judgment of the United States District Court for the Western District of Texas.

OPINIONS BELOW

The opinion of the United States District Court for the Western District of Texas (R. 64) is re-

ported in 28 F. Supp. 131. The opinion of the Circuit Court of Appeals (R. ~~1006~~) is reported in 107 F. (2d) 70. 1005

## JURISDICTION

The judgment to be reviewed was entered on November 3, 1939 (R. ~~1013~~). The jurisdiction of this Court is invoked under Section 240 of the Judicial Code as amended by the Act of February 13, 1925 (U. S. C. Title 28, Sec. 347).

## QUESTIONS PRESENTED

1. Whether the proration orders of the Railroad Commission of Texas controlling the production of oil in the East Texas field are unreasonable, arbitrary and confiscatory of the property of respondent, Rowan & Nichols Oil Company, and deprive it of its property without due process of law, in violation of the 14th Amendment to the Constitution of the United States, by giving weight to other physical and engineering factors than solely the ratio that the oil reserves of the respondent's lease bear to the total oil reserves in the field.

2. Whether the order of the United States District Court, affirmed by the Circuit Court of Appeals, that the Railroad Commission of Texas must allocate daily allowable production to the lease of the respondent at the same ratio to the total daily allowable for the East Texas field as the estimated recoverable oil in that lease bears to the estimated

recoverable oil in the entire East Texas field, to the exclusion of all other relevant physical and engineering factors (such as drainage or migration of oil from the west side to the east side of the field as it is produced, the potential of individual wells, the equitable use and dissipation of the total reservoir energy of the field, minimum well allowables, and relative times for production) itself is unreasonable, arbitrary and confiscatory of the property of the many correlative property owners in the field who would be deprived both of the oil beneath their lands and of the opportunity to produce that oil because of the preferential position in which the respondent is placed by this court order.

3. Whether the order of the District Court of the Western District of Texas, affirmed by the Circuit Court of Appeals for the Fifth Circuit, in effect is not contrary to the rule of property in oil laid down by the Supreme Court of the State of Texas, that ownership is of oil in place.

4. Whether the respondent, Rowan & Nichols Oil Company, discharged the burden of proving the illegality of the proration orders of the Railroad Commission of Texas, attacked in this case.

5. Whether the respondent, whose lease is more densely drilled, and has produced and is allowed to produce more oil per acre than the average of the East Texas field under the orders of the Railroad Commission is entitled to attack said orders on the ground that other producers or operators are al-

legedly receiving a relatively larger proportion of the daily allowable production from the whole field than respondent is receiving.

6. Whether the respondent, having made no attacks on the validity of the Railroad Commission's orders for over five years, during which time approximately 17,000 wells have been drilled in the East Texas field in reliance on the validity of the orders of the Railroad Commission and during which time the orders of the Railroad Commission have remained substantially unchanged, is estopped to attack the validity of the proration orders.

### THE FACTS

This suit was brought by the respondent, Rowan & Nichols Oil Company, against the petitioners, the Railroad Commission of Texas and its members and the Attorney General of Texas, seeking injunctive relief against the enforcement of the proration orders for the East Texas field on the ground that the orders deprived respondent of its property without due process of law in violation of the 14th Amendment to the Constitution of the United States in that they denied to respondent an "equal opportunity with other owners in the East Texas field to recover that portion of the oil to which it is entitled" (R. 10). The petitioners in their answer denied that the orders of the Railroad Commission of Texas were arbitrary or discriminatory, and al-

leged that such orders were necessary for the conservation of oil and gas and that the respondent, under the orders of the Railroad Commission of Texas was receiving and would receive in the future its fair share of the recoverable oil in the East Texas field (R. 48). A prayer for an interlocutory injunction was abandoned and the cause was tried on the prayer for a permanent injunction.

The respondent conceded (1) the validity of the statutes authorizing the Railroad Commission to regulate the production of oil and gas "in a reasonable manner" (R. 13); (2) the validity of the total allowable amount of daily production fixed by the Railroad Commission (R. 130, 601); (3) the validity of the spacing and drilling regulations promulgated by the Railroad Commission (R. 4, 21); (4) the legality of all the wells drilled under such regulations (R. 4); (5) the necessity of setting some minimum allowable for each well in the field (R. 328, 633, 638). Despite having conceded that the valid total allowable set for the field must be equitably divided among all the wells in the field with some minimum daily allowable per well to be set at the discretion of the Railroad Commission in the light of the facts adduced at regular administrative hearings, the respondent attacked the method whereby the total allowable production is allocated among the wells in the field drilled in accordance with spacing regulations upon the basis of the potential productive capacity of each well, with a minimum allowable of twenty barrels per



well per day below which no well capable of producing that amount is restricted.<sup>1</sup> The respondent prayed that its allowables be set currently solely in accordance with the ratio that its estimated oil reserves bear to the total estimated reserves for the field. (R. 7, 10, 647).

The method of proration here attacked is bottomed on the known facts concerning the physical factors existing in the East Texas field. The East Texas oil field is a vast body of oil located in the pore spaces in the eastern extremity of the Woodbine sand formation. In cross-section, from west to east, the field is roughly triangular in shape. The top, or long side of the triangle, running upward from west to east, is formed by the Austin chalk formation, which is impermeable and confines the

<sup>1</sup> The parties stipulated with reference to the method of proration as follows: (R. 995):

"1. The total daily allowable for the East Texas Field as fixed by the Railroad Commission order in force at the time of trial was about 522,500-barrels of oil.

"2. The order promulgated by the Railroad Commission and in force at the time of trial for the proration of this field allowable among the wells in the field provided: 'the owner or operator or manager of each well in the East Texas Field shall be permitted, either collectively or individually, to produce daily from each well a maximum of two and thirty-two hundredths (2.32) per cent of its hourly potential capacity as determined by the Commission.'

"3. In the application and enforcement of the above proration order (a) each well that could not produce as much as 20-barrels of oil per day was allowed to produce the maximum amount that it could produce; (b) where 2.32% of the hourly potential of any well would amount to less than 20-barrels per day, the well was allowed to produce 20-barrels of oil per day; (c) where 2.32% of the hourly potential of any well would amount to more than 20-barrels of oil per day, such well was allowed to produce 2.32% of its hourly potential.

"This application of the order resulted in the following: Approximately 451-wells, not any one of which was capable of producing as much as 20-barrels per day, were allowed to produce daily a total of approximately 5,250-barrels. Approximately 19,032-wells whose individual hourly potential when multiplied by 2.32% amount-



oil in the reservoir at the top. The bottom of the triangle, running approximately horizontally from the western edge of the field to about the middle of the field, is formed by the line of contact of the water in the Woodbine sand with the oil. The third side of the triangle is the Georgetown limestone formation, which begins at the water-oil contact line at about the middle of the field, and extends upward in an easterly direction to the point where it meets the Austin chalk.

The fact that the oil reservoir is triangular in cross-section means that the amount of oil underlying any particular lease depends on its location in the field. The thinnest sections of the field are in the western and eastern edges. From each edge,

ed to less than 20-barrels, were each allowed to produce a full 20-barrels per day; or from all of such wells a total of approximately 380,640-barrels per day. These were wells whose hourly potential ranged anywhere from 1-barrel to 860-barrels per hour. Approximately 6,325-wells whose individual potential when multiplied by 2.32% amounted to more than 20-barrels were each allowed to produce daily that number of barrels which equaled the product of its hourly potential multiplied by 2.32%. The total daily production from these wells was approximately 136,610-barrels. These wells had an hourly potential ranging from 865-barrels per hour to about 1,100-barrels per hour. In practical operation, the daily allowable of no well was controlled by the factor 2.32% of its hourly potential unless such well had a potential of 865-barrels or more per hour.

"The Plaintiff offered testimony to show that if each well in the field that could not make 20-barrels per day was allowed to produce the maximum which it was capable of producing, and if every well in the field that was capable of making 20-barrels per day was allowed to produce 20-barrels per day, that the aggregate of such production amounted to some 510,000 or 515,000-barrels of the daily allowable of approximately 522-500-barrels, with the result that only about 7,000 to 12,000-barrels of the total daily production was in the practical application of the order of the Commission prorated on the factor of 2.32% of the hourly potential of the wells.

"4. The testimony shows that the wells were shutdown on Saturdays and Sundays and were allowed to produce only five (5) days each week and the figures referred to in the testimony were for the days on which the wells were allowed to produce."

the oil sand gradually becomes thicker and reaches its maximum thickness of about one hundred feet at about the center of the field.

The amount of recoverable oil beneath any lease is not necessarily in exact proportion to the average thickness of the oil-saturated sand. The sand varies in certain physical characteristics, which affect the amount and the recoverability of the oil, such as the porosity and permeability of the sand, the size and location of impermeable streaks of volcanic ash and shale, and the amount of connate water. The percentage of oil recovered will also depend on the bottom hole pressure, which in turn depends on the location of the lease on the structure.

Almost all of the pressure in the East Texas field is furnished by the water drive, or the pressure of the water on the oil. The pressure arises from the fact that the surface outcrops of the Woodbine sand are about 3600 feet higher than the oil reservoir in the East Texas field, and the entire Woodbine sand (except where it contains oil or gas) is saturated with water. As the oil is withdrawn from the reservoir, the water on the western edge pushes in to take its place. As the water advances, it pushes oil ahead of it. The lowest portions of the field, being on the western side of the field, naturally will be drowned out by water first, and the highest portions of the field, in the center and on the east side, will be drowned out last. In the center and on the eastern side where the water has not yet encroached, when oil is withdrawn other oil is pushed in to take

its place, provided the sand is sufficiently permeable to permit the passage of the oil. In a large section in the center and on the eastern side of the field, including the respondent's Todd "B" lease, there is still as much oil in place beneath the surface as there was when the field was discovered, although oil has been produced for over eight years. The eastward migration of oil is, therefore, an important physical factor which affects the amount of oil which will be produced from any property in the East Texas field under any method of proration.

The respondent is the owner of a lease in the East Texas field known as its Todd "B" lease, containing 24.99 acres upon which it has drilled five wells. The respondent's lease is located in the "fairway," or portion of the field where the sands are thickest and most permeable, and east of the center of the field. It is situated in a portion of the field where the top of the Woodbine sand is very high and where no water has yet encroached, although it has produced over 355,000 barrels of oil up to the date of the trial (R. 675). The oil which has been withdrawn has been replaced by other oil, which was drained to respondent's lease from other leases to the west, north and south of respondent's lease. Due to this drainage, the respondent's lease still has in place beneath it substantially the same amount of oil as was originally in place beneath such lease. It has suffered no loss; on the contrary, it has made a net gain by drainage of an amount substantially equal to the amount of oil which has been

produced from its lease. The respondent's lease will produce many years after the leases with thinner sands have gone out of production. As the leases with thinner sands go out of production, the share of the total allowable assigned to respondent's wells will progressively increase. (R. 302, 396, 571).

The specific order attacked was the order of August 29, 1938, and it was agreed that the suit should cover subsequent orders continuing the same method of proration. (R. 666, 667). Under the order of August 29, 1938, the daily allowable production of the wells on the respondent's Todd "B" lease was slightly more than 22 barrels per well, or a total for the lease of 111.83 barrels. (R. 675). The District Court, finding for the respondent (R. 64), entered its order (R. 76) enjoining the enforcement of the proration orders of the Railroad Commission, as applied to respondent's property, and setting up the method of proration to be followed whereby the Railroad Commission is required to fix the amount of the allowable production for the Todd "B" lease at "that amount of oil which bears to the daily field allowable fixed by the Railroad Commission the ratio which 220 barrels bears to 522,000 barrels" (R. 78).<sup>2</sup> The District Court thus laid down the legal principle that proration must be based solely upon the ratio of the estimated oil reserves in a lease to the estimated oil reserves for

<sup>2</sup> The Court determined that based upon estimated yields of both the Todd "B" lease and the entire field that when the total daily allowable for the field was 522,000 barrels, as found in the Commission Order of August 29, 1938, then the proper allowable, under its theory, for the Todd "B" lease was 220 barrels. (R. 977)

an entire field without regard to compensating equitable factors designed to assure such a result over the life of a field. The Circuit Court of Appeals for the Fifth Circuit affirmed the judgment of the District Court but amended the judgment of the District Court so as to read "without prejudice to the right of the Commission to enter a reasonable proration order and to fairly enforce it." (R. ~~1012, 1013~~).

1010

### SPECIFICATION OF ERRORS.

The Circuit Court of Appeals erred:

(1) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary and confiscatory of the property of the respondent, and deprived it of its property without due process of law in violation of the 14th Amendment of the Constitution of the United States.

(2) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary, and confiscatory, such orders being designed to provide a producing schedule whereby each producer may obtain substantially the equivalent of the oil in place beneath his land and an equitable share in the natural reservoir energy of the entire field, because such a schedule provides varying tempos for production which temporarily disproportionately curtail highly productive wells to enable lesser wells.

to produce their oil before such wells are drowned out by water or their oil is drained away.

(3) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary and confiscatory in that a minimum allowable per well is set for all wells at not less than 20 barrels.

(4) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary and confiscatory in so far as they allocate the allowable production of oil on the basis of the potential producing capacity of each well in the field.

(5) In holding that the Railroad Commission must establish proration in the East Texas field so as to allocate to the respondent's lease a daily allowable production which bears to the total daily allowable for the field the same ratio that the estimated recoverable oil beneath such lease bears to the estimated recoverable oil in the entire field to the exclusion of all other relevant physical and engineering factors.

(6) In holding that the respondent, Rowan & Nichols Oil Company, discharged the burden of proving the illegality of the proration orders of the Railroad Commission attacked in this case.

(7) In failing to hold that the respondent, whose lease is more densely drilled than the average of the East Texas field, whose lease has produced and is allowed to produce more oil per acre under



the orders of the Railroad Commission than the average of the field, and whose lease shows substantially no depletion despite the large production from it over an extended period of time, is not in position to complain of the proration orders of the Railroad Commission on the ground that other producers are receiving an allegedly larger proportion of the daily allowable production from the whole field than respondent is receiving.

(8) In failing to hold that the respondent, having made no attacks on the validity of the Railroad Commission's orders for over five years, during which time approximately 17,000 wells have been drilled in the East Texas field in reliance on the validity of the orders of the Railroad Commission and during which time the orders of the Commission have remained substantially unchanged, is estopped to attack the validity of the proration orders.

## REASONS FOR GRANTING THE WRIT.

(1) The holding of the Circuit Court of Appeals in this case decides an important question seriously affecting the administration of the conservation acts not only of Texas but of other oil producing States having similar regulatory statutes and vitally affecting the property rights of the producers of approximately 26,000 wells in the East Texas field alone. This is a question which has not been but should be determined by this Court. The State



of Texas considers it of prime importance that it have a decision from this Court for the guidance of the State regulatory body in the administration of the Conservation laws of the State under the Constitution of the United States and for the protection of the property rights of the thousands of oil producers within the State.

The constitutionality of proration for the purpose of conserving oil and gas has been upheld by this Court. *Champlin Refining Company v. Corporation Commission*, 286 U. S. 210. However, this Court has not passed upon the question of what factors must be given weight in proration in order to comply with the Federal Constitution. Various methods of proration have been tried in the past and have proved impractical and have been abandoned. Previous methods have been condemned and stricken down by the Federal District Court. *People's Petroleum Producers, Inc. v. Smith*, 1 F. Supp. 361; cf. *Boxrollium Oil Co. v. Smith*, 4 F. Supp. 624; *Danciger Oil and Refining Co. v. Smith*, 4 F. Supp. 236; *MacMillan v. Railroad Commission*, 51 F. (2d) 400; *People's Petroleum Producers, Inc. v. Sterling*, 60 F. (2) 1041. Finally the potential-per-well method of allocation was sustained by the decision of the Federal District Court in *Amazon Petroleum Corp. v. Railroad Commission*, 5 F. Supp. 633, on February 12, 1934. Since then the Railroad Commission has continued its proration orders making modifications in the method in the light of new knowledge concerning the technology of oil production and new physical data collected in the constant study of con-

ervation methods. The decision in this case by the lower Courts would require a drastic change in the whole proration method seriously affecting the great investments amounting to almost two hundred million dollars which have been made in wells in the East Texas field in the past five years in reliance on the unchallenged proration policy of the Railroad Commission.

(2) The decision of the lower Federal Courts in this case is probably in conflict with the rule of property law laid down by the Supreme Court of Texas, the highest court in the State, determining the ownership of oil under proration. Under the common law in Texas the doctrine of "ownership in place" prevailed.

The Conservation statutes in Texas limit both the number of wells a producer may drill and the amount he can produce from each well. The Railroad Commission in limiting production from a common pool or reservoir must allocate the allowable production among the various producers "on a reasonable basis." The Supreme Court of Texas, while recognizing that it is "impossible to fix a standard which will give exact justice to all landowners" defines the right of a leaseowner under proration as the right to recover "a quantity of oil and gas substantially equivalent in amount to the recoverable oil and gas under his land." *Brown v. Humble Oil & Refining Co.*, 126 Tex. 296. See also *Gulf Land Co. v. Atlantic Refining Co.* (Texas

Supreme Court, not yet officially reported), 131 S. W. (2d) 73.

The record shows that the respondent even under the current method of proration has produced more than the average for the field per acre and nevertheless has substantially the same amount of oil as was originally in place beneath its lease, indicating favorable drainage to it of oil from beneath other lands. (R. 456). The respondent's lease will produce for many years after the leases with thinner sands have gone out of production; as other leases go out of production, the share of the total allowable assigned to respondent's wells will progressively increase. The decision of the lower Federal Courts in this case allocating allowables on a simple ratio would not only accentuate the degree of drainage to the lease of the respondent from less advantageously located producers but would give to the respondent a vested right in drainage oil, in conflict with the doctrine of ownership of oil in place and equitable withdrawals to give each producer substantially the amount of the oil in place beneath his lease. The decision below in this case would reestablish for the benefit of strategically located leases the rule of capture which proration was designed to supplant and at the same time through proration would prevent the less advantageously located producers from combatting drainage of oil from beneath their lands.

In this connection the District Court below found that at the present rate of production it would take

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28 years for the respondent to produce the estimated amount of recoverable oil beneath its tract while the field would be depleted in 11 years. (R. 72). The Circuit Court of Appeals adopted different figures, calculating that it would take 16 or 17 years to deplete the field during which time the respondent "would be permitted to produce only one-half of the oil it owns." (R. 101<sup>18</sup> 11). Both calculations were based upon estimates of recoverable oil which were shown to have varied as much as 55%. (R. 906). Furthermore, these calculations wholly ignore the fact that respondent's lease is located high on the structure and will produce oil long after nearly all of the rest of the field has been depleted. The calculations ignore the fact that as edge wells go out of production, there will be fewer wells to divide the total field allowable, and that the daily allowable of the respondent's wells will be correspondingly increased.

(3) The theory adopted by the Courts below would result in the confiscation of the oil of other producers and in itself would be violative of the 14th Amendment of the Constitution of the United States. The respondent claims that the Railroad Commission must adopt a method of proration based on the current estimated amount of recoverable oil in place beneath each lease in the field. This theory was embraced by the District Court, which enjoined the Commission from reducing the allowable of the wells on respondent's lease below a figure which represented the ratio of the estimated recoverable oil beneath the respondent's lease to the es-

timated recoverable oil beneath the whole field. (R. 78). The Circuit Court of Appeals modified the District Court's judgment, but in effect endorsed the District Court's conclusion that the proration order must be based on the current estimate of the recoverable oil in place. (R. ~~1012~~).

1010

This method of proration is confiscatory in two ways: first, by eliminating the 20-barrel marginal allowable, it would so reduce the allowable of wells on small tracts as to make it impossible for the owners of such tracts to produce the oil beneath such tracts; and second, it would confiscate the property of the owners of leases in the western portion of the field by accelerating the natural eastward migration of the oil and making it impossible for such owners to produce more than a small fraction of the oil originally beneath their leases. For example, under the method proposed by the Court, a lease with ten feet of sand on the western side of the field having the same acreage as respondent's lease would be allowed to produce only about one-tenth as much oil each day as respondent's lease, which is alleged to have somewhat less than one hundred feet of sand. This would give substantial justice only if both leases produced the same length of time. But the facts are that the lease on the west side will be drowned out by the encroaching water long before respondent's lease will go off production. The result will be that the lease in the western portion of the field will produce only a fraction of its oil, while losing the rest by drainage to the wells to the east, while the respondent's lease will



recover much more than the equivalent of the recoverable oil originally in place beneath such lease. The natural advantage of the structural position of respondent's lease and all other leases similarly situated will be greatly exaggerated, and large quantities of oil will be taken away from other leases and given to respondent's lease and leases similarly situated. The effect of the decision of the Circuit Court of Appeals will be to redistribute the property rights in oil in the East Texas field, giving to some owners much more and to others much less than the equivalent of the recoverable oil originally in place beneath their leases. The decision of the Circuit Court of Appeals in this respect probably conflicts with the applicable local decisions upon this important question of local law. *Brown v. Humble Oil & Refining Co.*, 126 Tex. 296; *Gulf Land Company v. Atlantic Refining Company* (Texas Supreme Court, not yet officially reported) 131 S. W. (2d) 73.

(4) The Courts below hold that the order of the Railroad Commission is void and in violation of the 14th Amendment to the Constitution of the United States although there was substantial evidence introduced to the effect that the order of the Railroad Commission was reasonably necessary in order to prevent the waste of oil and gas and in order to insure an equitable distribution of the production from the wells in the East Texas field. In this respect the decision is probably in conflict with *Champlin Refining Co. v. Corporation Commission*,

286 U. S. 210; *Henderson Company v. Thompson*,  
300 U. S. 258.

(5) The method of proration adopted by the Railroad Commission, and stricken down by the decisions of the lower courts, substantially gives to operators in the East Texas field, and particularly to the respondent, a reasonable opportunity to recover its fair share of the oil from the East Texas field. The method of allocation is based on a percentage of the hourly potential producing capacity of each well. The potential capacity of a well to produce is the most practical way of arriving at the total effect of the factors determining the amount of recoverable oil beneath a lease, including the factors of sand thickness, porosity, permeability, and bottom hole pressure. In other words, wells drilled on leases having thick sand, and high porosity, permeability and bottom hole pressure, will have high potentials; while wells drilled on leases having thin sand with low porosity, permeability, and bottom hole pressure, will have low potentials. Although the proration formula does not *expressly* contain a factor of sand thickness or a factor of the amount of recoverable oil beneath each well, the potential factor does directly reflect sand thickness and the amount of recoverable oil.

The proration formula does not expressly include the factor of acreage. This was held by the District Court to be in itself a sufficient ground for invalidating the order, (R. 70), and the District Court's decision was sustained by the Circuit Court



of Appeals. The decisions of both lower courts however, fail to recognize the fact that the acreage of each lease is considered by the Railroad Commission in its spacing rules, which must be construed together with its proration orders. In other words, the more acreage an operator has, the more wells he may drill and the larger the allowable which is assigned to his lease.

The respondent has certainly not been damaged by the failure of the Commission to make acreage an express factor in its proration formula. The respondent's lease, with five wells on 24.99 acres, is more densely drilled than the field as a whole. Furthermore, respondent on its own application has been granted by the Railroad Commission a permit to drill another well on its lease, which it has neglected to drill. The respondent's lease, had, up to the trial, produced 14,210 barrels per acre, while the average per acre production of the East Texas field up to that date was only 9,810 barrels. (R. 675). While certain town-site areas are more densely drilled than respondent's lease, such dense drilling is not in the vicinity of the respondent's lease, but some 15 to 20 miles away. The Circuit Court of Appeals was clearly mistaken in stating that this dense drilling was on "nearby" tracts. (R. 166). Furthermore, so long as the respondent is receiving its fair share of the oil, it cannot complain because others will receive more than their fair share. *Kuehner v. Irving Trust Co.*, 299 U. S.

(6) The respondent has long acquiesced in and benefitted by the orders of the Railroad Commission attacked. Each of its five wells was drilled as an exception to Rule 37, and by May 21, 1934, it had drilled its well No. 5, (R. 675), bringing its lease to a density of one well to 4.99 acres, a density which has not yet been reached by the average in the field, even after five years, during which approximately 15,000 wells have been drilled. The result of respondent's early and comparatively dense drilling has been that it has recovered approximately 50% more oil per acre from its lease than the average of the field. Since 1933, the orders of the Railroad Commission have been substantially unchanged, except that the factor of the percentage of the potential and the minimum allowable have been decreased and shut-down days have been introduced. During this period, approximately 17,000 oil wells have been drilled in the East Texas field. Proration orders have been promulgated on the average of about once every month, and although the respondent has occasionally protested at hearings before the Railroad Commission, it has not chosen to take appeals from such orders to the courts, as are provided by the Texas statutes. Art. 6049c, Section 8, Vernon's Annotated Civil Statutes of Texas. The holding of the Circuit Court of Appeals that the respondent, though benefitting from and acquiescing in the Railroad Commission's proration orders for over five years, is entitled to attack them now, is probably in conflict with *Life and Casualty Insurance Company of Tennessee v. McCray*.

291 U. S. 566; *Pierce Oil Corporation v. Phoenix Refining Co.*, 259 U. S. 125.

### CONCLUSION

The question involved is one of vital importance which calls for an authoritative ruling by this Court. The decision of the Court below is in substantial conflict with decisions of the highest State court, and itself raises serious constitutional doubts. For the reasons stated, therefore, it is respectfully submitted that this petition for a writ of certiorari should be granted.

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By

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Attorneys for Petitioners.

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# SUPREME COURT OF THE UNITED STATES

October Term, 1939

\_\_\_\_\_  
NO. 681  
\_\_\_\_\_

RAILROAD COMMISSION OF TEXAS, ET AL.,  
Petitioners  
v.

ROWAN & NICHOLS OIL COMPANY,  
Respondent

\_\_\_\_\_  
BRIEF FOR PETITIONERS  
\_\_\_\_\_

On Writ of Certiorari to the United States Circuit  
Court of Appeals for the Fifth Circuit.

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NO. 681

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IN THE  
**Supreme Court of the United States**

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October Term, 1939

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RAILROAD COMMISSION OF TEXAS, ET AL,  
Petitioners

v.

ROWAN & NICHOLS OIL COMPANY,  
Respondent

---

**BRIEF FOR PETITIONERS**

---

**OPINIONS BELOW**

The opinion of the United States District Court for the Western District of Texas (R. 64) is reported in 28 F. Supp. 131.

The opinion of the Circuit Court of Appeals (R. 1005) is reported in 107 F. (2d) 70.

**STATEMENT OF GROUNDS OF  
JURISDICTION**

The jurisdiction of this court is invoked under Section 240 of the Judicial Code as amended by the Act of February 13, 1925, (U. S. C. Title 28, Sec-

tion 347). The judgment of the Circuit Court of Appeals for the Fifth Circuit was entered on November 3, 1939 (R. 1010). The petition for the writ of certiorari was filed in this court on January 29, 1940, and the petition for writ of certiorari was granted by this court on March 11, 1940.

### STATEMENT OF THE CASE

This suit was brought by the respondent, Rowan & Nichols Oil Company, against the petitioners, the Railroad Commission of Texas and its members and the Attorney General of Texas, seeking injunctive relief against the enforcement of the proration orders for the East Texas field on the ground that the orders deprived respondent of its property without due process of law in violation of the 14th Amendment to the Constitution of the United States in that they denied to respondent an "equal opportunity with other owners in the East Texas field to recover that portion of the oil to which it is entitled" (R. 10). The petitioners in their answer denied that the orders of the Railroad Commission of Texas were arbitrary or discriminatory, and alleged that such orders were necessary for the conservation of oil and gas and that the respondent under the orders of the Railroad Commission of Texas was receiving and would receive in the future its fair share of the recoverable oil in the East Texas field (R. 48). A prayer for an interlocutory injunction was abandoned and the cause was tried on the prayer for a permanent injunction.



The respondent conceded (1) the validity of the statutes authorizing the Railroad Commission to regulate the production of oil and gas "in a reasonable manner" (R. 13); (2) the validity of the total allowable amount of daily production fixed by the Railroad Commission (R. 130, 306, 601); (3) the validity of the spacing and drilling regulations promulgated by the Railroad Commission (R. 4, 21, 374); (4) the legality of all the wells drilled under such regulations (R. 4); (5) the necessity of setting some minimum allowable for each well in the field (R. 328, 633, 638). Despite having conceded that the valid total allowable set for the field must be equitably divided among all the wells in the field with some minimum daily allowable per well to be set at the discretion of the Railroad Commission in the light of the facts adduced at regular administrative hearings, the respondent attacked the method whereby the total allowable production is allocated among the wells in the field drilled in accordance with spacing regulations upon the basis of the potential productive capacity of each well, with a minimum allowable of twenty barrels per well per day below which no well capable of producing that amount is restricted. The respondent prayed that its allowables be set currently in accordance with the ratio that its estimated oil reserves bear to the total estimated reserves for the field. (R. 7)

The specific order attacked was the order of August 29, 1938, and it was agreed that the suit should cover subsequent orders continuing the same method of proration. (R. 666, 667)

The parties stipulated with reference to the method of proration as follows: (R. 995)

1. The total daily allowable for the East Texas Field as fixed by the Railroad Commission order in force at the time of trial was about 522,500-barrels of oil.

2. The order promulgated by the Railroad Commission and in force at the time of trial for the proration of this field allowable among the wells in the field provided: 'the owner or operator or manager of each well in the East Texas Field shall be permitted, either collectively or individually, to produce daily from each well a maximum of two and thirty-two hundredths (2.32) per cent of its hourly potential capacity as determined by the Commission.'

3. In the application and enforcement of the above proration order (a) each well that could not produce as much as 20-barrels of oil per day was allowed to produce the maximum amount that it could produce; (b) where 2.32% of the hourly potential of any well would amount to less than 20-barrels per day, the well was allowed to produce 20-barrels of oil per day; (c) where 2.32% of the hourly potential of any well would amount to more than 20-barrels of oil per day, such well was allowed to produce 2.32% of its hourly potential.

"This application of the order resulted in the following: Approximately 451-wells, not any one of which was capable of producing as much as 20-barrels per day, were allowed to produce daily a total of approximately 5,250-barrels. Approximately 19,032-wells whose individual

hourly potential when multiplied by 2.32% amounted to less than 20-barrels, were each allowed to produce a full 20-barrels per day; or from all of such wells a total of approximately 380,640-barrels per day. These were wells whose hourly potential ranged anywhere from 1-barrel to 860-barrels per hour. Approximately 6,325-wells whose individual potential when multiplied by 2.32% amounted to more than 20-barrels were each allowed to produce daily that number of barrels which equaled the product of its hourly potential multiplied by 2.32%. The total daily production from these wells was approximately 136,610-barrels. These wells had an hourly potential ranging from 865-barrels per hour to about 1,100-barrels per hour. In practical operation, the daily allowable of no well was controlled by the factor 2.32% of its hourly potential unless such well had a potential of 865-barrels or more per hour.

"The Plaintiff offered testimony to show that if each well in the field that could not make 20-barrels per day was allowed to produce the maximum which it was capable of producing, and if every well in the field that was capable of making 20-barrels per day was allowed to produce 20-barrels per day, that the aggregate of such production amounted to some 510,000 or 515,000-barrels of the daily allowable of approximately 522,500-barrels, with the result that only about 7,000 to 12,000-barrels of the total daily production was in the practical application of the order of the Commission prorated on the factor of 2.32% of the hourly potential of the wells.

"4. The testimony shows that the wells were shutdown on Saturdays and Sundays and were

allowed to produce only five (5) days each week and the figures referred to in the testimony were for the days on which the wells were allowed to produce."

Each of the wells on respondent's lease has an hourly potential of about 964 barrels, (R. 95) and under the orders of the Railroad Commission attacked in this case, the daily allowable production of the wells on the respondent's Todd "B" lease was slightly more than 22 barrels per well, or a total for the lease of 111.83 barrels. (R. 107, 611) (See Exhibit 2, offered R. 120, copied R. 675)

Prior to the filing of this suit the respondent filed with the Railroad Commission an application for an increase in the allowable on its Todd "B" lease and in the alternative for permits to drill twenty additional wells. A hearing was held by the Railroad Commission and a permit was granted for a sixth well. (See Exhibit 14, offered R. 348, copied R. 881) No action was taken by the Railroad Commission on the respondent's application for an increase in its allowable. Respondent has not drilled its well No. 6 although the permit to drill such well is still in effect. By drilling the sixth well, respondent could have increased the allowable for its lease to about 133 barrels daily. (R. 612)

The method of proration here attacked is bot-tomed on the known facts concerning the physical factors existing in the East Texas field. The East Texas oil field is a vast body of oil located in the

pore spaces in the eastern extremity of the Woodbine sand formation. The field is about forty miles in length from north to south, has an average width from east to west of about four miles, and has a surface acreage of about 133,000 acres. In cross-section, from west to east, the field is roughly triangular in shape. (R. 353) The top, or long side of the triangle, running upward from west to east, is formed by the Austin chalk formation, which is impermeable and confines the oil in the reservoir at the top. The bottom of the triangle, running approximately horizontally from the western edge of the field to about the middle of the field, is formed by the line of contact of the water in the Woodbine sand with the oil. The third side of the triangle is the Georgetown limestone formation, which begins at the water-oil contact line at about the middle of the field, and extends upward in an easterly direction to the point where it meets the Austin chalk.

The fact that the oil reservoir is triangular in cross-section means that the amount of oil underlying any particular lease depends on its location in the field. The thinnest sections of the field are in the western and eastern edges. (R. 102) From each edge, the oil sand gradually becomes thicker and reaches its maximum thickness of about one hundred feet at about the center of the field.

The amount of recoverable oil beneath any lease is not necessarily in exact proportion to the average thickness of the oil-saturated sand. The sand varies in certain physical characteristics, which affect

the amount and the recoverability of the oil, (R. 509) such as the porosity and permeability of the sand, the size and location of impermeable streaks of volcanic ash and shale, and the amount of connate water. (R. 365, 424) The percentage of oil recovered will also depend on the bottom-hole pressure, which in turn depends on the location of the lease on the structure. The high pressures are on the west side, and the low pressures on the east side. (R. 355)

Almost all of the pressure in the East Texas field is furnished by the water drive, or the pressure of the water on the oil. (R. 361) The pressure arises from the fact that the surface outcrops of the Woodbine sand are about 3600 feet higher than the oil reservoir in the East Texas field, and the entire Woodbine sand (except where it contains oil or gas) is saturated with water. (R. 556) As the oil is withdrawn from the reservoir, the water on the western edge pushes in to take its place. As the water advances, it pushes oil ahead of it. (R. 604-605) The lowest portions of the field, being on the western side of the field, naturally will be drowned out by water first, (R. 409) and the higher portions of the field, in the center of the field in the vicinity of respondent's lease, will be drowned out last. (R. 457, 571) In the center and on the eastern side where the water has not yet encroached, when oil is withdrawn other oil is pushed in to take its place, provided the sand is sufficiently permeable to permit the passage of the oil. (R. 562) In a large section in the center and in the eastern half of the field, includ-



ing the respondent's Todd "B" lease, there is still as much oil in place beneath the surface as there was when the field was discovered, although oil has been produced for over eight years. (R. 462, 621) The eastward migration of oil is, therefore, an important physical factor which affects the amount of oil which will be produced from any property in the East Texas field under any method of proration.

While abandonments on the west side are taking place because of the drowning of the wells by the encroachment of the water, abandonments are also taking place on the east side because of the drop in pressure, due to the fact that pressure is not transmitted across the entire field. (R. 363, 582) The history of the field shows that about two-thirds of the abandonments are taking place on the west side, and about one-third of the abandonments on the east side. (R. 571, 583) The result is that the portion of the field in the neighborhood of respondent's lease will produce longer than any other portion of the field. (R. 572, 583)

The East Texas oil field was discovered in October, 1930, and from said date up to the date of trial, the field produced approximately 1,304,730,000 barrels of oil. (R. 109) At the time of the trial, approximately 25,910 wells had been drilled in the East Texas field, (R. 221) and the average density of drilling of the field was one well to about 5.13 acres. (R. 149) As oil has been withdrawn from the East Texas field, there has been a drop in bottomhole pressure in the field, from an average of about 1625



pounds (R. 354) to an average of about 1106 pounds per square inch. (R. 358) The average water level in the field has risen from an estimated depth below sea level of approximately 3320 feet (R. 367, 378) to approximately 3310 feet, although the rise has been irregular. (R. 295, 378, 389) The highest point in the sand is approximately 130 feet above the average water level. (R. 614)

The respondent's Todd "B" lease contains 24.99 acres upon which it has drilled five wells, all as exceptions as to the spacing rules under special permission of the Railroad Commission. (R. 144) All five wells are flowing wells. The respondent's lease is located in the "fairway," or the portion of the field where the sands are thickest and most permeable, (R. 109, 459, 460) and east of the center of the field. (R. 622) It is situated in a portion of the field where the top of the Woodbine sand is very high (R. 392, 459) and where no water has yet encroached, (R. 621) although it has produced over 355,000 barrels of oil up to the date of the trial. (R. 109, 191) The oil which has been withdrawn has been replaced by other oil, which was drained to respondent's lease from other leases to the west, north and south of respondent's lease. (R. 395, 398, 616) Due to this drainage, the respondent's lease still has in place beneath it substantially the same amount of oil as was originally in place beneath the lease. (R. 456) It has suffered no loss; on the contrary, it has made a net gain by drainage of an amount substantially equal to the amount of oil which has been produced from its lease. (R. 401) The respondent's lease will

produce many years after the leases with thinner sands have gone out of production. (R. 402, 527) As the leases with thinner sands go out of production, the share of the total allowable assigned to respondent's wells will progressively increase. (R. 302, 397, 409, 415, 571)

The District Court, finding for the respondent (R. 64), entered its order (R. 76) enjoining the enforcement of the proration orders of the Railroad Commission, as applied to respondent's property. The court accepted the estimate of the respondent's engineers as to the reserves of oil beneath respondent's tract and the reserves in the entire field, and also their calculation that if the allowable were prorated solely on the basis of reserves of oil in place, when the total daily allowable for the field was 522,000 barrels the proper allowable under the respondent's theory for its Todd "B" lease would be 220 barrels. (R. 132) The District Court by its judgment set up the method of proration to be followed whereby the Railroad Commission was required to fix the amount of the allowable production for the Todd "B" lease at "that amount of oil which bears to the daily field allowable fixed by the Railroad Commission the ratio which 220 barrels bears to 522,000 barrels." (R. 78) The District Court thus laid down the legal principle that proration must be based solely upon the ratio of the estimated oil reserves in a lease to the estimated oil reserves for an entire field, at the time the order is promulgated, without regard to compensating equitable factors designed to assure a fair ultimate recovery over the life of the field for all

portions of the field. The Circuit Court of Appeals for the Fifth Circuit affirmed the judgment of the District Court but amended the judgment of the District Court so as to read "without prejudice to the right of the Commission to enter a reasonable proration order and to fairly enforce it." (R. 1010)

### **SPECIFICATION OF ERRORS TO BE URGED**

The Circuit Court of Appeals erred:

(1) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary and confiscatory of the property of the respondent, and deprive it of its property without due process of law in violation of the 14th Amendment of the Constitution of the United States.

(2) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary, and confiscatory, such orders being designed to provide a producing schedule whereby each producer may obtain substantially the equivalent of the oil in place beneath his land and an equitable share in the natural reservoir energy of the entire field, because such a schedule provides varying tempos for production which temporarily disproportionately curtail highly productive wells to enable lesser wells to produce their oil before such wells are drowned out by water or their oil is drained away.

(3) In holding that the proration orders of the

Railroad Commission are unreasonable, arbitrary and confiscatory in that a minimum allowable per well is set for all wells at not less than 20 barrels.

(4) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary and confiscatory in so far as they allocate the allowable production of oil on the basis of the potential producing capacity of each well in the field.

(5) In holding that the Railroad Commission must establish proration in the East Texas field so as to allocate to the respondent's lease a daily allowable production which bears to the total daily allowable for the field the same ratio that the estimated recoverable oil beneath such lease bears to the estimated recoverable oil in the entire field to the exclusion of all other relevant physical and engineering factors.

(6) In holding that the respondent, Rowan & Nichols Oil Company, discharged the burden of proving the illegality of the proration orders of the Railroad Commission attacked in this case.

(7) In failing to hold that the respondent, whose lease is more densely drilled than the average of the East Texas field, whose lease has produced and is allowed to produce more oil per acre under the orders of the Railroad Commission than the average of the field, and whose lease shows substantially no depletion despite the large production from it over an extended period of time, is not in position to com-

plain of the proration orders of the Railroad Commission on the ground that other producers are receiving an allegedly larger proportion of the daily allowable production from the whole field than respondent is receiving.

(8) In failing to hold that the respondent, having made no attacks on the validity of the Railroad Commission's orders for over five years, during which time approximately 17,000 wells have been drilled in the East Texas field in reliance on the validity of the orders of the Railroad Commission and during which time the orders of the Commission have remained substantially unchanged, is estopped to attack the validity of the proration orders.

## ARGUMENT

### SUMMARY

(1) Under the property law of Texas, a landowner is entitled under proration to recover "a quantity of oil and gas substantially equivalent in amount to the recoverable oil and gas under his land." See *Brown v. Humble Oil & Refining Co.*, 126 Tex. 296, 312. The respondent failed to discharge the burden of showing that it will, under the method of proration attacked, receive less than the equivalent of the oil and gas originally in place under its land, and it particularly failed to show that it is presently being irreparably damaged. Having failed to show irreparable injury to it from the alleged in-

valid features of the orders, respondent is without standing to attack the constitutionality of such orders.

(2) Respondent is further without standing to attack the constitutionality of the proration orders because it has acquiesced in and benefitted from the enforcement of the same method of proration for over five years before bringing this suit. During this period about 17,000 wells representing an investment of over \$170,000,000 have been drilled in the East Texas field in reliance upon the validity and continued enforcement of the method of proration attacked. A large part of this investment would be destroyed by striking down the proration orders of the Commission and adopting the method of proration advocated by the respondent.

(3) On their merits, the proration orders are justified by the necessities of the situation as they affect the performance by the Railroad Commission of its statutory duties to prevent waste and to distribute the allowable production on a reasonable basis. The chief complaint is against the assignment of a minimum or marginal allowable to each well. It was admitted by all of the expert witnesses that it was necessary that *some* marginal allowable be assigned to each well in order to prevent the premature abandonment of a large number of wells. It was admitted further that such premature abandonments would result in the loss of oil which could be recovered only through such wells, and a loss to the owners of such wells of the oil that would have



been produced from such wells. Considering all of the facts relating to the field and its development, the amount of the marginal per-well allowable fixed by the Railroad Commission was not unreasonably high.

(4) The method of proration advocated by the respondent and embraced by the lower courts (that the allowable should be prorated on the basis of oil reserves) would confiscate the property of a large number of operators in the East Texas field, because (1) it would make it impossible for operators in the western and eastern portions of the field to obtain the equivalent of the oil originally in place beneath their land and (2) it would make it impossible for the owner of a small tract of land to drill a well and recover the oil beneath his land. While taking the oil from such operators, it would allow operators in the "fairway," such as respondent, to recover much more than the equivalent of the oil originally in place beneath their leases.

## I.

Under the decisions of the Supreme Court of Texas, a landowner under proration is entitled to an opportunity to recover substantially the equivalent of the oil and gas originally in place beneath his land.

The Supreme Court of Texas, prior to the beginning of the regulation of the production of oil and gas by the Railroad Commission, adopted and has

since followed the rule that the owner of an oil and gas lease owned the oil in place beneath the surface of his lease. *Texas Company v. Daugherty*, 107 Tex. 226; *Stephens County v. Mid-Kansas Oil & Gas Company*, 113 Tex. 160; *Waggoner Estate v. Sigler Oil Company*, 118 Tex. 509; *Lemar v. Garner*, 121 Tex. 502; *Sheffield v. Hogg*, 124 Tex. 290. The right of ownership in place was however subject to the correlative right in all leaseholders in the same field, under the rule of capture, to drill wells upon their tracts and to produce all of the oil which would flow to the surface, even though such oil might be drained from beneath other tracts. See *Stephens County v. Mid-Kansas Oil & Gas Company*, 113 Tex. 160, 167; *Prairie Oil & Gas Company v. State* (Texas Commission of Appeals) 231 S. W. 1088, 1091.

The rule of ownership in place and also the rule of capture are necessarily modified by the conservation statutes and the rules promulgated by the Railroad Commission. Under such statutes and rules, the owner of an oil and gas lease is no longer entitled to drill as many wells as he pleases upon his lease, nor can he produce as much oil as he pleases from such wells.

The statutes do not fix any rigid standard to be followed by the Railroad Commission in distributing the allowable production under proration orders. Section 7 of Article 6049c of the Revised Civil Statutes of Texas, as amended, (See Appendix, *infra*, page 65) merely provides that the Railroad Commission must distribute or prorate the allowable

production among the various producers in a field "on a reasonable basis."

The Supreme Court of Texas has discussed the question of the property rights of owners of oil and gas property in the case of *Brown v. Humble Oil & Refining Company*, 126 Tex. 296. In this opinion, the Texas Supreme Court undertook to state the right of the owners of oil and gas property, at common law and under the conservation statutes and regulations, as follows: (126 Tex. 296, 305)

"The common law recognizes no well spacing regulations. At common law the land owner can drill an unlimited number of wells for oil and gas upon his land. *Mills & Willingham, Oil & Gas* (1926), §270; *Summers, Oil & Gas* (1927), 73-76. The adjoining land owner cannot complain if wells are drilled near his boundary line. Under this rule the only way the land owner can protect himself is to drill offset wells. *Prairie Oil & Gas Co. v. State*, 231 S. W. 1088 (Tex. Comm. App., 1921); *Hunt v. State*, 48 S. W. (2d), 466 (Texas Civ. App., 1932); *Kelly v. Ohio Oil Co.*, 57 Ohio St., 317, 49 N. E. 399, 39 L.R.A., 765, 63 Am. St. Rep., 721 (1897); *Barnard v. Monongahela Natural Gas Co.*, 216 Pa., 362, 65 Atl., 801 (1907). However, this rule has been modified in this State. Title 102, Vernon's Annotated Texas Civil Statutes, and particularly Arts. 6014, 6029, 6046.

"The rule in Texas recognizes the ownership of oil and gas in place, and gives to the lessee a determinable fee therein. *Lemar v. Garner*, 121 Texas, 502, 50 S. W. (2d) 769; *Humphreys-*

Mexia Co. v. Gammon, 113 Texas, 247, 254 S. W., 296, 29 A.L.R., 607; Waggoner Estate v. Sigler Oil Co., 118 Texas, 509, 19 S. W. (2d), 27; Texas Co. v. Daugherty, 107 Texas, 226, 176 S. W., 717, L.R.A., 1917F, 989.

"Owing to the peculiar characteristics of oil and gas, the foregoing rule of ownership of oil and gas in place should be considered in connection with the law of capture. This rule gives the right to produce all of the oil and gas that will flow out of the well on one's land; and this is a property right. And it is limited only by the physical possibility of the adjoining land owner diminishing the oil and gas under one's land by the exercise of the same right of capture. The following decisions discuss the law of capture as applied in this State: Stephens v. Mid-Kansas Oil & Gas Co., 113 Texas, 160, 254 S. W., 290; Houston & T. C. Ry. Co. v. East, 98 Texas, 146, 81 S. W., 279, 66 L. R. A., 738, 107 Am. St. Rep., 620; Prairie Oil & Gas Co. v. State (Comm. Appls.) 231 S. W., 1088. Both rules are subject to regulation under the police power of a state.

*"It is impossible to measure the exact quantity of oil and gas beneath each tract of land. It is equally impossible to fix a standard which will give exact justice to all land owners. Some land owners wish to produce oil and gas to the limit while others desire to keep their oil and gas in the ground and develop it in less quantities. Hence arises the conflict of interests. It is now, however, recognized that when an oil field has been fairly tested and developed, experts can determine approximately the amounts of oil and gas in place in a common pool, and can*

also equitably determine the amount of oil and gas recoverable by the owner of each tract of land under certain operating conditions." (Emphasis added)

Later in the same opinion the court said: (126 Tex. 296; 312)

"Conditions may arise where it would be proper, right, and just to grant exceptions to the rule so as to permit wells to be drilled on smaller tracts than prescribed therein. Also, conditions may arise where it would be proper, right, and just to permit tracts to be subdivided and such subdivisions drilled after the adoption of the rule; but in all such instances it is the duty of the Commission to adjust the allowable, based upon the potential production, so as to give to the owner of such smaller tract only his just proportion of the oil and gas. *By this method each person will be entitled to recover a quantity of oil and gas substantially equivalent in amount to the recoverable oil and gas under his land.*" (Emphasis added)

In the recent case of *Gulf Land Company v. Atlantic Refining Company* (Texas Supreme Court, not yet officially reported) 131 S. W. (2d) 73, 80, substantially the same rule was stated:

"It is the law that every owner or lessee of land is entitled to a fair chance to recover the oil and gas in or under his land, or their equivalents in kind."

The foregoing quotations from the opinions of the Supreme Court of Texas are the only statements

which that court has made with reference to the property rights of a landowner under proration. The criterion stated by the court is an ideal to be approximated as closely as possible rather than a standard which must be rigidly followed, for the court has recognized that it is "impossible to measure the quantity of oil and gas beneath each tract of land," or to "give exact justice to all landowners." See *Brown v. Humble Oil & Refining Company*, 126 Tex. 296, 316.

The rule laid down by the Supreme Court of Texas does not categorically state the time at which the property rights of the landowner in oil and gas are to be determined. The court does not specifically say that the owner is entitled to receive substantially the equivalent of the oil and gas *originally* in place beneath his lease when the field is first opened. Respondents here assert that property rights are to be determined by the amount of oil in place beneath his lease *on the date of each proration order*, which the Railroad Commission customarily issues every month or so.

This question is of great practical importance, because of the recognized physical characteristics of the East Texas oil field. Under proration, the rate of depletion in the different portions of the field varies greatly, so that the proportion of the total reserves which lies underneath any piece of land is constantly changing. If the right of each landowner is to be determined by the proportion of the total oil reserves beneath his land at the time each order



of the Railroad Commission is issued, the inevitable result will be that the portions of the field that will be first depleted, because they are on the western and eastern edges of the field, will get much less than the amount of oil originally in place. On the other hand, the owners of land in the fairway, where production will continue longer than in any other portion of the field, will get much more than the amount of oil originally in place.

It is submitted that the only reasonable construction to place upon the language in the opinions of the Supreme Court of Texas is that the owner is entitled under proration to receive substantially the equivalent of the oil *originally* in place beneath his land. It was not intended by the proration laws to redistribute the property rights in an oil and gas field, such as the East Texas field, by taking oil away from the owners of properties on the western and eastern sides of the field, and giving it to owners in the center of the field. At the common law, the owners of the properties on the edges of the field would have been permitted to drill as many wells and produce as much oil from such wells as would be necessary to prevent or at least to minimize the loss of oil to the fairway properties. They are prevented from using these methods of self-help by the conservation orders. In order that they may not lose thereby, the Texas Supreme Court has said in effect in *Brown v. Humble Oil & Refining Company, supra*, that the proration orders should be so adjusted that they can recover their oil before their properties are depleted.

The owners of the fairway properties, such as respondent, are not entitled to assert a property right to recover more than the equivalent of the oil originally in place beneath their property. A landowner, such as respondent, who during the producing life of his leases will recover substantially the equivalent of the oil originally in place beneath the lease, is receiving under the Texas property law all that he is legally entitled to demand.

## II.

The respondent failed to establish that it is being irreparably injured by the enforcement of the proration orders of the Railroad Commission, because the undisputed evidence shows that the respondent has suffered no physical depletion of its lease, and has benefitted from the operation of the proration orders up to the present time.

Respondent has no standing to attack the proration orders of the Railroad Commission unless it establishes that it is being damaged by the enforcement of such orders. Compare *Premier-Pabst Sales Company v. Grosscup*, 298 U. S. 226; *Aetna Insurance Co. v. Hyde*, 275 U. S. 440; *Utah Power & Light Co. v. Rfost*, 286 U. S. 165; *First National Bank v. Louisiana Tax Commission*, 289 U. S. 60; *Gorieb v. Fox*, 274 U. S. 603; *Roberts & Schaeffer Co. v. Emerson*, 271 U. S. 50.

The enforcement of conservation statutes or reg.

ulations necessarily restricts the present enjoyment of the property affected. To accomplish the purpose of such statutes, it may be necessary to restrict some persons more than others. Exact equality of treatment is a practical impossibility. The question to be decided, therefore, is not whether respondent has been restricted in the enjoyment of some of its property rights or whether it has an exactly equal opportunity with others to produce oil, but whether the restrictions imposed unnecessarily or unreasonably deprive respondent of the use of its property. Reasonable restrictions upon the use of oil and gas property have been upheld. *Henderson Company v. Thompson*, 300 U. S. 258; *Champlin Refining Company v. Corporation Commission of Oklahoma*, 286 U. S. 210; *Ohio Oil Company v. Indiana*, 177 U. S. 190; *Walls v. Midland Carbon Company*, 254 U. S. 300; *Bandini Petroleum Company v. Superior Court*, 284 U. S. 8.

The respondent's lease is located east of the center of the field, (R. 622) and in a portion of the field where the top of the sand is very high. (R. 392, 459) The result of its favorable location is that although there have been produced from this lease about 358,000 barrels of oil, (R. 400; see Exhibit 1, offered R. 120, copied R. 674) *there is in place beneath the lease at this time substantially the same amount of oil as was in place when the East Texas field was first opened.* This was admitted by the experts who testified for the respondents, Mr. Buck (R. 311-312) and Mr. Foran (R. 621).

The expert for the Railroad Commission, Mr. Cottingham (R. 397, 399, 456) testified that the oil which had been withdrawn through respondent's wells has been replaced by oil drained from other leases to the west, north and south of the respondent's lease, and that there had been a net gain by the respondent, due to such migration, of approximately 350,000 barrels of oil. Mr. Cottingham explained that the difference of about 8,000 barrels between the amount produced from the respondent's wells and the amount drained to its lease from other leases was accounted for by the expansion of the oil in the reservoir due to the drop in the reservoir pressure, i. e., that a slightly smaller amount of oil was compressed into the same space because of the lower pressure. (R. 397)

Mr. Rowan testified that the cost of drilling a well is about \$10,000. (R. 158) and that the price of oil is about \$1.25 per barrel. (R. 159) Taking an average price of only \$1.00 per barrel, the respondent has already produced to date from its Todd "B" lease an amount of oil equivalent in value to about seven times the cost of the wells which it has drilled upon its lease.

The Rowan and Nichols tract is now more densely drilled than the average of the field (R. 500-501) and it has a permit to drill a sixth well, which could give it a still greater density advantage and additional allowable of about 22 barrels daily. (R. 612) Considering the field as a whole, there are only 11,465 wells located on leases that are less densely drilled

than respondent's lease, as against about 14,445 wells on leases that are not so densely drilled. (R. 436) Mr. Rowan admitted that every well upon his lease had been drilled by special permission of the Railroad Commission as an exception to the spacing rules and that he has always led in dense drilling in the vicinity of his lease. (R. 149, 152) The result of the early and comparatively dense drilling of the Rowan and Nichols tract has been that the average production per acre from the Rowan and Nichols tract up to the time of the trial has been 14,210 barrels per acre, whereas the average production per acre from the whole field has been only 9,810 barrels per acre. (R. 89; see Exhibit No. 1, offered R. 120, copied R. 674; Exhibit No. 2, offered R. 120, copied R. 675) By reason of the density of drilling and the weight given to the potential of its wells, the respondent is now producing about 4.47 barrels per acre daily, whereas the average daily production per acre in the field is 3.92 barrels.

There are certain areas which are more densely drilled than the respondent's lease, but the Circuit Court of Appeals was clearly in error in stating that such densely drilled areas were "nearby leases" (R. 1008). These densely drilled areas are located generally at a distance of fifteen or more miles from the respondent's lease, and do not drain the respondent's lease. This was admitted by Mr. Rowan, who testified that the only densely drilled area within five miles of his lease was the Gladewater area, which by reason of the fact that it was located on the west edge of the field, would have no effect

on draining his lease (R. 164). Mr. Rowan further testified that the densely drilled areas described in Exhibit No. 3 (offered R. 121, copied R. 677), introduced by the respondent, were just picked out to give a general idea of how the field had been developed (R. 166) and that *on the basis of density of drilling, respondent has no complaint.* (R. 167)

So long as respondent's lease is more densely drilled than the average of the field, and particularly since it has been granted by the Railroad Commission a permit to drill a sixth well, which it has neglected to drill, respondent is not in a position to complain because there are still other tracts, which do not drain respondent's tract, which by reason of density of drilling may be receiving a larger per-acre recovery than respondent. Respondent has fared much better than the average, and it cannot complain, on the basis that others are receiving undue benefits, when it at least is being treated fairly. In an analogous situation, Mr. Justice Roberts said in the case of *Kuehner v. Irving Trust Company*, 299 U. S. 445, 455:

"If, however, the statute does not deal unfairly with the petitioners it does not lie in their mouths to object because some one else perchance will receive a larger proportion of his ultimate loss as the same is ascertained years hence than will the petitioners."

In view of the admitted fact that the respondent has already recovered an amount of oil sufficient to pay back the cost of its wells many times over, that



it has not suffered any physical depletion, that it has recovered much more oil per acre than the average of the field, and that it is still recovering daily an amount of oil far in excess of the cost of operating its wells, respondent certainly cannot claim that it has been or is being irreparably damaged at this time. The only disadvantage it can possibly claim is the fact that it is presently curtailed in its right to enjoy its property. Respondent having conceded that its wells, theoretically capable of producing about 20,000 barrels per day, can legally be curtailed to about 44 barrels per day for purposes of conservation, can hardly contend that it is being unreasonably deprived of its right of present enjoyment by a curtailment of its per-well daily allowable by an additional small fraction of their potential capacity, which the commission has found necessary to protect the correlative rights of all the producers in the field.

### III.

Respondent failed to establish that it will be deprived, by the enforcement of the proration orders of the Railroad Commission, of the opportunity of ultimately recovering from its lease an amount of oil substantially equivalent to the amount of oil originally in place beneath its lease.

The respondent failed to present any clear and convincing proof that it will not, during the producing life of its lease, recover substantially the equivalent of the oil and gas originally beneath its lease.

In the first place, the respondent's evidence showed

that there had been wide discrepancies between the estimates which its experts had made of the amount of recoverable oil beneath its lease. The evidence showed that in May, 1933, before a three-judge Federal court at Fort Worth, Mr. Rowan estimated the amount of recoverable oil per acre originally beneath his lease as 45,000 barrels. At the hearing before the Railroad Commission in May, 1938, Mr. Rowan estimated that his original recoverable reserves per acre were 70,000 barrels. At the trial in this action in February, 1939, he estimated the original recoverable reserves per acre at 60,000 barrels. (R. 189-190, 399. See Exhibit No. 37, offered R. 500, copied R. 906). The respondent's own estimates of the amount of recoverable oil originally beneath its lease have thus varied as much as fifty-five per cent, and they varied thirty-three per cent between the time of the hearing before the Railroad Commission in May, 1938, and the trial in February, 1939.

The position taken by the experts for the Railroad Commission was that it is impossible to make any exact estimate of the recoverable oil beneath any lease in the East Texas field, because of the many factors entering into such a calculation which could not be known with certainty. These factors include the water level, the top of the Woodbine sand formation, the thickness and extent of shale partings and lenses, the degree of porosity and permeability of the Woodbine sand, the amount of connate water, and the bottomhole pressure. See the testimony of Mr. Cottingham (R. 365, 366, 369, 380, 381, 382, 387, 389) and the testimony of Mr. Hudnall. (R. 509-518)

Even Mr. Buck, one of respondent's experts, (R. 234) and Mr. Rowan himself (R. 163, 171-174) admitted that there are irregularities in the sand, and that variations occur which would affect the accuracy of any estimate of recoverable reserves.

The respondent's calculations that it had been hurt by the proration order in the past, and that it will fail to recover an amount of oil equivalent to the oil in place beneath its lease during the producing life of its lease, are not only based upon assumptions as to recoverable reserves which cannot be established with accuracy, but they also assume certain facts which are contrary to the undisputed physical conditions in the field. For example, with respect to the operation of the proration orders up to the date of the trial, Mr. Rowan first testified that while there were 60,000 barrels per acre originally in place beneath his lease, at the time of the trial there were only 46,000 barrels per acre. (R. 106) This was directly contrary to the plain physical facts, which are that there is substantially as much oil in place beneath respondent's lease now as there was originally, and this fact was admitted by Mr. Foran, one of respondent's experts. (R. 621) This fact was also finally admitted by Mr. Buck, the respondent's other expert, (R. 311-312) who, however, undertook to explain his answer by saying that he meant by "recoverable reserves under a tract," "the amount of oil that he will reduce to possession in his tank, *wherever it might come from.*" (R. 308) It was by means of defining "recoverable oil" in this manner that respondent's experts were able to

arrive at the estimate of a loss to the Rowan & Nichols tract, although in fact there had been practically no physical depletion. (See Exhibit No. 2, offered R. 120, copied R. 675-676)

The respondent's calculations that it would not recover in the future an amount of oil equivalent to its "recoverable oil" were adopted by the District Court and the Circuit Court of Appeals, although the two courts did not adopt the same figures. The District Court found that at the present rate of production, it would take 28 years for the respondent to produce the estimated amount of recoverable oil beneath its tract while the field would be depleted in 11 years. (R. 72) The Circuit Court of Appeals adopted the calculations that it would take 16 or 17 years to deplete the field during which time the respondent "would be permitted to produce only approximately one-half of the oil it owned." (R. 1009) The calculations, both by the District Court and the Circuit Court of Appeals, are apparently based on the figures appearing in Exhibit 2 (offered R. 120, copied R. 675-676).

In addition to the inaccuracies and uncertainties which are due to any calculations as to the amount of oil underneath any tract, it is apparent that it was to the advantage of the respondent to make a high estimate of his own reserves and a low estimate of the reserves of all of the rest of the field, in order to make it appear that the whole field would be exhausted before the respondent would have the opportunity of recovering the oil from its lease. However, the main vice in the respondent's calculations

is that they wholly ignore the actual facts in connection with the production of oil from the East Texas oil field. These calculations are based on the assumptions that there will be in the future the same total field allowable and that the total allowable for the respondent's lease will also remain exactly what it is now. These assumptions wholly ignore the fact that the field is being depleted from the edges inward toward the fairway, and that the respondent's lease is in a portion of the field which will produce longer than any other portion of the field. The effect of the way in which the field will actually be depleted is that if the total field allowable is kept constant, the allowable of the respondent's lease will necessarily increase as the wells in the depleted areas go off production. (R. 527) If the field allowable remains constant, the respondent's allowable will necessarily increase, because there will be fewer wells to share in the total allowable, and the estimates based on the assumption that the allowable of respondent's lease would remain the same are therefore misleading. It was finally reluctantly admitted by Mr. Buck, the man who made the calculations, that the allowable of the Rowan & Nichols lease would increase in the future (R. 299-300) and that it would not take as long for that lease to produce its oil as his calculations would indicate. (R. 302)

The experts for the Railroad Commission testified positively that under the method of proration attacked, the respondent, during the producing life of its lease, would be permitted to produce at least the equivalent of the oil originally in place beneath its

lease. This is due to the long productive life of respondent's lease, which is located high on the structure and otherwise very favorably with reference to all surrounding areas. Respondent's lease will be in the area which produces longer than any other portion of the field, the western leases being drowned out by water, and the eastern leases being depleted by reason of the drop in bottomhole pressure in that area. See particularly the testimony of Mr. Cottingham (R. 393-395, 456-457) and Mr. Hudnall (R. 514, 527, 571)

It is respectfully submitted that the lower courts were clearly in error in accepting calculations which were based upon unsatisfactory and highly uncertain estimates, and which involved assumptions wholly without support in the actual physical facts in the East Texas field.

#### IV.

Respondent is without standing to attack the constitutionality of the proration orders, because it has benefited from and acquiesced in the enforcement of the same method of proration for over five years before bringing a suit to set aside such orders, during which time property rights have vested which would be destroyed by the invalidation of such orders.

Although the East Texas field was opened in October, 1930, early attempts by the Legislature of



the State of Texas, and by the Railroad Commission under its delegated authority, to prorate the East Texas field, were invalidated by the Federal District Courts. *MacMillan v. Railroad Commission of Texas*, D. C. 51 F. (2d) 400; *People's Petroleum Producers, Inc., v. Smith*, D. C., 1 F. Supp. 361. In April, 1933, the Commission passed an order, based on the well potential method of proration. This order was attacked by respondent, Rowan & Nichols Oil Company, as well as other operators, and a hearing on a temporary injunction before Judge Hutcheson and others was held at Fort Worth in May, 1933. (R. 134) See 1 Summers, Oil & Gas (Perm. Ed. 1938) S. 96, n. 46. The Federal Court, finding that the Commission had followed the direction of the court in the prior cases, upheld the Commission's order. The opinion of the court in these cases is not reported, but a reference to the decision is found in *Amazon Petroleum Corporation v. Railroad Commission*, D. C. 5 F. Supp. 633, 636:

"The next suits submitted on application for interlocutory injunction at Fort Worth were unlike any of the others we had had. Some of the plaintiffs in them were complaining that the allowable was too high, some that it was too low, and some that it was not properly apportioned. *Here it is being shown that the commission had at last acted in obedience to the mandate of the statute and the injunction of the court to equitably prorate the allowable over the field in accordance with the different capacities of the wells, we denied the injunction from the bench without opinion.*" (Emphasis added)

The case of *Amazon Petroleum Corporation v. Railroad Commission, supra*, involved a proration order for the East Texas field based on the well potential method of allocation, but in sustaining the order, the court did not specifically pass upon the formula for the distribution of the total allowable.

From the date of the decision in the *Amazon* case (February 12, 1934) up to the filing of the present action by the respondent, there has been no attack on the method of proration in the East Texas field.\* The method of proration has remained substantially the same, except that the percentage of the hourly potential permitted to be produced has been reduced from 15 per cent to 2.32 per cent, the marginal allowable has been decreased from 40 barrels to 20 barrels, and shutdown days have been put into effect. Mr. Rowan testified that the present method of proration had been in effect since April, 1933, (R. 134) and Mr. Buck, respondent's expert, who had formerly been employed by the Commission in 1933 and who had kept up with the developments in the field since said date, testified that the method of allocation had always been practically on a per-well basis. (R. 330-331) Since April, 1933, when the last attack was made upon the order by the respondent, 17,000 wells have been drilled in

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\*Mr. Rowan claimed that he had made certain protests before the Railroad Commission on indefinite dates (R. 138-139) but it was undisputed that prior to bringing this action, respondent had not taken advantage of its statutory right to appeal from the proration orders of the Railroad Commission, which are usually issued monthly. Appeals are allowed by Article 6049c, s. 8, Appendix, p. 66, *infra*.

the East Texas field (R. 524) which admittedly represent an investment of at least \$170,000,000.

It was the position of the respondent at the trial that the Railroad Commission should not consider the fact that the scheme of proration has been in effect for over five years or the number of wells which have been drilled while the order has been in effect. See the testimony of Mr. Rowan. (R. 138) In other words, the court was asked to ignore the fact that the operators who have drilled wells in reliance on the continuance of the method of proration have property rights in their wells, in addition to the property rights in the oil beneath their land. In effect, the court was asked to say to an operator who had diligently drilled his lease under the spacing rules of the Railroad Commission that he was "a fool for having drilled four wells where one would be enough." (Compare *MacMillan v. Railroad Commission*, D. C. 51 F. (2d) 400, 402).

For over five years the respondent has acquiesced in and benefited from the proration scheme now attacked. By May 1, 1934, it had drilled the last of its five wells, all of which were drilled as exceptions to Rule 37. By its dense drilling, respondent has caused adjoining owners to drill 20 wells as offsets. (R. 149) The density of drilling on its lease has been one well to 4.99 acres, a density which has not yet been reached by the average in the field. The result of respondent's early and comparatively dense drilling and the distribution of the allowable under the well potential plan has been that re-

spondent. has recovered approximately 50 per cent more oil per acre from its lease than the average of the field, and has made a net gain by drainage from other leases of about 350,000 barrels. (R. 397)

The presumption of validity which attaches to the Railroad Commission's orders is fortified by the acquiescence continued over a period of more than five years. *Life and Casualty Insurance Company of Tennessee v. McCray*, 291 U. S. 566.

By accepting the benefits of the proration order for over five years, the respondent has lost its standing to attack the constitutionality of such orders. Compare *Pierce Oil Corporation v. Phoenix Refining Company*, 259 U. S. 125; *St. Louis Malleable Casting Co. v. Prendergast Construction Co.*, 260 U. S. 469.

The confiscatory effect of the change in the proration plan to the method advocated by respondent is discussed at pages 52-56, *infra*. Briefly, the respondent's proposed plan of proration would be confiscatory in two ways: First, by eliminating the 20-barrel marginal allowable, it would so reduce the allowable of wells on small tracts as to make it impossible for the owners of such tracts to produce the oil beneath such tracts; and second, it would confiscate the property of owners of leases on the sides of the field by exaggerating the structural advantage of the "fairway" properties, and by making it impossible for owners on the western

and eastern sides of the field to recover more than a fraction of the oil originally beneath their leases.

V.

**Respondent failed to establish that the marginal or minimum allowable assigned to each well in the East Texas field is not reasonably necessary in order to prevent waste and the confiscation of property.**

Assuming for the purpose of this discussion that the respondent is entitled to attack the proration orders, we submit that the evidence wholly fails to show that the proration plan is unreasonable or arbitrary. The respondent's essential complaint is against the marginal or minimum per-well allowable, but the respondent failed to show by clear and convincing evidence that in this respect the Railroad Commission has exceeded the proper limits of its administrative discretion.

It is well settled by the decisions of this Court that to all administrative regulations purporting to be made under authority legally delegated, there attaches a presumption of the existence of facts justifying the specific exercise, and that proration orders, for example, will not be held invalid unless they are shown to bear no reasonable relation either to the prevention of waste or the protection of correlative rights, or are shown to be otherwise arbitrary. See *Thompson v. Consolidated Gas Utilities Corp.*, 300 U. S. 55, 69. Compare *Walls v. Midland*

*Carbon Co.*, 254 U. S. 300, 324; *Henderson Co. v. Thompson*, 300 U. S. 258, 264; *Champlin Refining Co. v. Corporation Commission*, 286 U. S. 210, 234. And in reviewing the administrative determination, the court will examine the record, not to see whether the findings of the courts below are supported by evidence, but to ascertain upon the whole record whether it is possible to say that the administrative action is without rational basis. Compare *South Carolina State Highway Department v. Barnwell Brothers, Inc.*, 303 U. S. 177, 191; *Knoxville v. Knoxville Water Co.*, 212 U. S. 1, 7.

The top or total field allowable for the East Texas field was fixed by the Railroad Commission as being the approximate amount of oil which could be daily withdrawn from the East Texas field without causing an unduly rapid drop in the bottom-hole pressure. In fixing this figure, the Railroad Commission was discharging its duty to prevent physical waste. (R. 358) After fixing the top allowable for the field, the next step for the Railroad Commission was to distribute or prorate the allowable among the wells in the field. In distributing this allowable, the Commission was under two duties: first, to prevent waste; and second, to prevent confiscation of property. See Revised Civil Statutes, Articles 6014 (c), 6029 (1), 6049c (7), Appendix, *infra*, pages 58-66.

Under the provisions of the marginal well statute, Article 6049b, Revised Civil Statutes (see Appendix, p. 62, *infra*) the Railroad Commission



was prohibited from restricting production from pumping wells which have a daily capacity of not more than 20 barrels. Such wells must be allowed to produce their full capacity. There are only 451 wells in this class. The validity of this classification was not seriously questioned, but the principal complaint was against the action of the Railroad Commission in giving at least 20 barrels per day to all wells in the field that were capable of producing that much.

In the discharge of its duty to prevent waste, the Railroad Commission was required not to reduce the allowable production of any of the wells in the field to such an extent as to cause the physical waste of a substantial amount of recoverable oil, which would result from the premature abandonment of such wells. In complying with the statutory injunction to distribute "on a reasonable basis" it could not unreasonably restrict the production from wells so as to make it impossible for the owners to recover the oil beneath their leases.

The marginal or minimum allowable is 20 barrels to every well which is capable of making that amount, which in effect is reduced to 14.28 barrels per day when averaged over a week, in view of the two-day shutdown required each week. (R. 995)

It was conceded by all of the experts that some minimum allowable is necessary in order to permit the wells that have already been drilled to continue to operate and to produce the oil that can be

produced only through such wells. The only difference of opinion was to the amount of the marginal or minimum allowable.

Mr. Buck, one of the experts for the respondent, testified that his idea was that a minimum allowable of between 15 and 17½ barrels per day should be permitted. (R. 304) He also expressly stated that a minimum allowable was necessary for the prevention of waste. (R. 328)

Mr. Foran, the last expert used by the respondent, testified emphatically that he believed in a minimum, but that he would recommend an average minimum of 10 barrels, rather than 14 barrels, although he would not "say arbitrarily 10 barrels." (R. 633-638)

Mr. Hudnall, one of the experts for the Railroad Commission, testified that a minimum allowable was necessary (R. 521) and that the minimum fixed by the Railroad Commission was a reasonable minimum below which it would not be safe for the Railroad Commission to go without probably causing the waste of recoverable oil. (R. 522, 523, 525)

Mr. Cottingham testified that if the present minimum were reduced, there would be premature abandonments of wells, particularly on the west side (R. 410-411) which would prevent the owners of such wells from recovering their oil, and would result in the trapping of oil which would not be recovered by any well. (R. 411-412, 421, 422)

The view adopted by the District Court was that the Commission should assign to the poor wells "substantially less than 20 barrels each," the exact amount not being stated. (R. 990, 994) The same view apparently was taken by the Circuit Court of Appeals, which said, "It would seem that a more equitable order could be drafted by fixing a lower maximum production for the smaller wells and raising the percentage of potential production allowed. But that is a question to be decided by the Commission as to which we express no opinion." (R. 1009)

The Circuit Court of Appeals was clearly in error in stating, "There is undisputed evidence tending to show that a pumping well in the field averaging five barrels production a day can be operated with some profit, although the cost of installing pumping apparatus would be about \$3,500 a well." (R. 1009) Apparently, the court's statement was based upon the testimony of Mr. Rowan, who testified that he would allow a five-barrel minimum for each tract of 10 acres or less, regardless of the number of wells drilled on such tract. (R. 154) Mr. Rowan, however, stated that his idea of a minimum allowable of five barrels to each ten-acre tract did not have any relation to what oil a man ought to be allowed to take out of his tract in order to pay back the cost of a well (R. 159), and that his testimony that a well could be operated on five barrels was related to wells which have already paid out under the present method of proration, and particularly to wells on the east side, where the expense of pumping water does not exist. (R. 160)

Furthermore, Mr. Hudnall stated that wells on the west side are plugged and abandoned when their production declines to 10 barrels (R. 522-523) and that "14 barrels a day is about the minimum at which they will drill and produce oil" (R. 525). Mr. Foran, one of respondent's witnesses, thought that a 10-barrel marginal for the east side, as well as for the west side, would be proper. (R. 637) Even Mr. Buck testified that an allowable of five barrels per day for flowing wells would cause such wells to go on the pump in "about two weeks," thereby nullifying the benefit of the reservoir pressure in producing the oil as well as necessitating the installation of expensive pumping equipment. (R. 276-278)

The state of the testimony, therefore, with reference to the reasonableness of the amount of the allowable fixed by the Commission, was decidedly not "undisputed" against the Commission's action, and was in such shape that a reasonable person could not say that the Railroad Commission had acted arbitrarily in fixing a minimum allowable of 20 barrels, considering that under the shut-down order the average production was reduced to 14.28 barrels per day. The Railroad Commission is certainly entitled to some latitude in the exercise of its discretion, and it did not go beyond reasonable bounds in this instance.

## VI.

The well potential method of allocation is the best practical means of allocating the allowable according

to the productive capacities of the wells and, together with the spacing rules of the Railroad Commission, gives fair consideration to the recoverable oil under each tract.

While some effort was made at the trial to attack the manner in which the potential tests were made by the Railroad Commission, Mr. Rowan finally admitted, "As far as the potential is concerned, I have no complaint." (R. 175)

The well potential method of allocation was first adopted on April 22, 1933, and was upheld by the judgment of the three-judge district court at Fort Worth in May, 1933. See 1 Summers, *Oil and Gas*, (Perm. Ed. 1938) s. 96, n. 46. It has been in effect from that date up until the date of the trial in this case.

The potential tests are made by measuring the actual amount of oil certain key wells will flow during an hour's time under given conditions. The potential test is the best practical way of ascertaining the productive capacity of a well. (R. 426) The factors affecting the amount of recoverable oil within the drainage area of the well, which are reflected by a potential test, include the porosity and permeability of the sand, the sand thickness, the bottomhole pressure, the position of the lease on the structure and, to some extent, the percentage of connate water. See the testimony of Mr. Cottingham (R. 426-427), Mr. Hudnall (R. 529-530), and Mr. Buck (R. 325). It is true that a potential test

does not necessarily give an indication of any single factor which enters into the productive capacity of a well, since a good well, for example, may have either thick sand and relatively low pressure or thin sand and relatively high pressure. However, since we are only interested practically in determining the manner in which all of the factors will combine in actual operation, it is of relatively little importance to know exactly what part each of the separate factors plays in the total result.

The essential objection to the well potential method of allocation is that it gives too much emphasis to the number of wells on a tract.\* In other words, it is argued by respondent that by this method of allocation, undue benefits are given (1) to the operators of leases with thin sands, and (2) to the operators of leases which are densely drilled.

First, it should be pointed out that the relatively narrow spread between the best wells in the field, which receive an allowable of about 26 barrels per day, and the wells receiving the flat per-well marginal allowable of 20 barrels, is caused by the necessities of the situation. It was agreed that the total field allowable was necessarily restricted to about the figure of 522,000 barrels in order to prevent a rapid drop in bottomhole pressure which would result in physical waste. (R. 130, 306, 601) The minimum allowable to each well cannot be safely lowered

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\*Even a straight per-well allowable has worked satisfactorily in 251 oil fields in Texas. Sixty-six fields are on a well potential basis of allocation. None of these fields have uniform spacing. See the testimony of Mr. Cottingham. (R. 392, 488)



below the present figure without danger of causing physical waste and confiscation. (See pages 38-43, *supra*) The distribution of the minimum allowable to the 25,910 wells in the field takes up nearly all of the total allowable, leaving only a few thousand barrels to be distributed by the Railroad Commission under any formula. (R. 415-416, 482, 572)

Furthermore, in actual operation, the well potential method of distribution does not work unfairly. The answer to the objection that undue preference is given to the leases having thin sands is that such leases will last for a comparatively short time, and that the leases with the thick sands, while at present restricted to an allowable not much greater than the leases on the edge of the field, will ultimately recover their fair share of the oil because of their longer producing life. (R. 391)

The experts agreed that the leases on the west side of the field would be depleted before the leases in the fairway, due to the encroachment of the water as the oil is produced. (R. 288, 394, 571) Furthermore, the history of the field shows that at the same time abandonments are taking place on the west side, abandonments are also taking place on the east side, due to the drop in the bottomhole pressure. (R. 292, 514, 517, 571) About two-thirds of the abandonments have taken place on the west side, and one-third on the east side. (R. 583) The leases in the fairway, like the respondent's leases, will have a longer producing life than any other leases in the field (R. 571) and under the present proration plan

will be permitted to get the most oil. (R. 408) As the wells on the edges of the field are depleted, the allowable of each of the wells in the fairway will be progressively increased. (R. 409, 415) If they were now allowed to produce in proportion to their reserves, they would have the double advantage of a larger present production and a longer producing life. (R. 396, 527)

With reference to the objection that the proration order favors densely drilled tracts, it should be pointed out, first, that while the proration order does not expressly take acreage into consideration, the acreage of each lease is considered by the Railroad Commission in its spacing rules, which must be construed together with its proration orders. In other words, the more acreage an operator has, the more wells he may drill, thereby obtaining a larger allowable for his lease. (R. 481)

Where dense drilling has been permitted by the Railroad Commission, it has been permitted only after a hearing in each case, and only after a finding by the Railroad Commission that the drilling of each particular well was necessary in order to prevent waste or to prevent the confiscation of property. See the provisions of Rule 37, the Railroad Commission's spacing rule, as set forth in Exhibit No. 17 (offered R. 349, copied R. 896). Under the Texas statutes, Article 6049c, Revised Civil Statutes, as amended, (Appendix, *infra*, page 64) any person who has been affected by the granting of any such permit is permitted to appeal to the District Court

of Travis County, Texas, to set aside such permit. Every well now drilled has either been acquiesced in by the affected property owners, or, if attacked in court, has been upheld by the Texas courts.

The method of permitting the drilling of wells as exceptions to Rule 37 is illustrated by the procedure followed in drilling respondent's lease. Because of the shape and area of its lease, respondent was required to obtain special permission to drill each of its wells as an exception to Rule 37. In applying for such permits, respondent represented that "the drilling of these additional wells applied for herein would in no way cause or create physical waste and that the ultimate recovery from said acreage would be greater if these permits were granted and these additional wells drilled, and therefore waste avoided by the recovery of this oil which would not otherwise be brought to the surface." (R. 141) In view of this representation to the Commission when respondent was getting its permits, the contention now comes with ill grace from respondent that in permitting the drilling of wells as exceptions to Rule 37, the Railroad Commission allowed "unnecessary" drilling.

It is impossible to know whether or not any lessee whose lease is densely drilled will recover more or less than the equivalent of the oil originally in place beneath his lease, without knowing the particular facts in connection with the physical characteristics of the oil sands beneath his lease, the length of time his wells have been producing, the probable produc-

ing life of such wells, and all other relevant factors. The history of the field shows that the Woodbine section is "uniformly irregular" (R. 509) and within the same ten-acre area there will be found producing wells, dry holes, and wells which have been plugged and abandoned. (R. 512-15) The respondent in this case, of course, did not attempt to go into the physical situation with reference to each of the wells permitted to be drilled by the Commission. In fact, the District Court refused to go into the merits of the orders granting permits to drill. (R. 493) There was no evidence justifying the court in finding, contrary to the express finding of the Commission in each case where these wells were drilled, that the wells were "unnecessary." In general, the Railroad Commission has attempted to permit drilling without special permit where the drilling distances are greater than 660 feet from another producing well or 330 feet from a boundary line, but has undertaken to supervise the drilling of wells at closer distances. With reference to this matter, the Supreme Court of Texas said in the case of *Gulf Land Company v. Atlantic Refining Company*, 131 S. W. (2d) 73, 80:

"It has devised a plan or pattern by which it starts by allowing wells to be drilled, as a matter of course, at such minimum distances. After that, in order to drill wells, special permits must be had."

The Commission generally has tried to permit each landowner to obtain substantial justice by drilling to substantially the same density as the area sur-

rounding his lease. (R. 427) This is illustrated by the respondent's lease, which at present is about as densely drilled as the surrounding area and the average of the field as a whole, even without drilling its sixth well.

We deem it advisable to refer to one specific instance of a small tract, because it has been referred to repeatedly by the District Court (R. 976, 978, 983), as well as by the respondent in its briefs. This is the one-acre tract of R. M. Wood, which adjoins one corner of the respondent's lease. This tract has been cited repeatedly by the respondent as a horrible example of the effect of the 20-barrel minimum or marginal allowable as it applies to small tracts.

The actual facts in connection with this lease show that the Railroad Commission did not act unreasonably. A permit was granted to R. M. Wood on his one-acre tract on December 23, 1936, (see Exhibit No. 50, offered R. 600, copied R. 955); a motion for rehearing was granted on January 27, 1937, (see Exhibit 51, offered R. 600, copied R. 956) and the permit was finally reaffirmed on March 4, 1937. (See Exhibit 52, offered R. 600, copied R. 957) An appeal was taken from the order of the Railroad Commission by Rowan & Nichols Oil Company and Shell Petroleum Corporation to the District Court of Travis County, Texas. Rowan & Nichols Oil Company and Shell Petroleum Corporation lost their suit in the district court, and the judgment of the district court was affirmed in the Court of Civil Appeals. *Shell Petroleum Corporation v. Railroad*

*Commission*, 120 S. W. (2d) 526. Application for writ of error was dismissed by the Texas Supreme Court.

The R. M. Wood permit was granted "to prevent confiscation of property." Wood did not drill his well until August, 1937, and at that time respondent had been producing from its lease for over six years. (R. 114) During this time, respondent and other adjacent producers had been draining oil from underneath Wood's tract to the extent of about 10,000 barrels. (R. 569) Taking the respondent's estimate of the recoverable oil beneath its lease, (see Exhibit 37, offered R. 500, copied R. 906) Wood originally had underneath his one-acre lease about 60,000 barrels of recoverable oil. With an allowable of about 22 barrels per day, it would take Wood 2,727 days to produce his recoverable oil, or over 10 years on the basis of 261 producing days each year, considering the two-day shutdown each week. (Compare Exhibit No. 2, offered R. 120, copied R. 675) In other words, it will be about eight years in the future before R. M. Wood will be able to recover the equivalent of the recoverable oil originally underneath his lease. He is just now recovering the equivalent of the oil which was drained from his lease by other producers. Wood has not injured respondent up to the present time, but has merely offset the drainage of his lease by wells belonging to respondent and other producers.

The example of the Wood lease was picked by the respondent for the purpose of showing an extreme



case of discrimination by the Commission but a careful examination of the facts shows that even in this case the Commission has done substantial justice. It is submitted that the District Court and the Circuit Court of Appeals were clearly in error in picking out isolated examples of densely drilled leases and holding that the method of proration was unfair because of the assignment of a minimum per-well allowable to the wells on such leases, without knowing the particular circumstances justifying the granting of the permit or the amount of the allowable in each instance.

## VII.

The method of proration, advocated by the respondent and adopted by the lower courts, of prorating the allowable production in proportion to the reserves of oil beneath each lease, would be discriminatory and confiscatory of the property of many operators in the East Texas field and would permit operators in the fairway, such as respondent, to recover much more than the equivalent of the oil originally in place beneath their leases.

It was the claim of the respondent that it is entitled to receive a daily allowable of 220 barrels per day, when the total field allowable is 522,000 barrels per day, on the ground that the field allowable should be based solely on the reserves beneath its lease, as compared to the total reserves in the field. This was the testimony of Mr. Rowan (R.

131-132) The District Court embraced this method of proration by permanently enjoining the Railroad Commission from interfering with the production by complainant of "that amount of oil which bears to the daily field allowable fixed by the Railroad Commission the ratio which 220 barrels bears to 522,000 barrels." (R. 78) The Circuit Court of Appeals modified the judgment to the extent of providing that it should be "without prejudice to the right of the Commission to enter a reasonable proration order and fairly enforce it," (R. 1010) but expressly agreed with the District Court "that in entering an order prorating the amount of oil allowed to be produced from each well, the Commission should take into consideration the amount of oil in place under the lease" (R. 1009-1010) and apparently endorsed the conclusion of the District Court that "essential factors" in allocating the daily allowable were "the depth of sand under each acre and the estimated amount of oil in place." (R. 1008)

A consideration of the physical characteristics of the East Texas field and of its past history leads inescapably to the conclusion that no method of proration could be in effect more discriminatory or confiscatory of a large number of operators than the method of prorating the allowable on the basis of the current estimated reserves in place beneath each lease. This method of proration wholly ignores the fact that various portions of the field will have different periods of time within which they can be operated so as to produce their oil. Even the respondent's experts, Mr. Foran (R. 615-617) and Mr.

Buck (R. 288) admitted that because of the physical situation in the field, leases such as the Rowan & Nichols lease would last much longer than leases to the west of them.

The operation of the formula proposed by respondents and adopted by the lower courts can be illustrated by assuming an example of a lease on the west side of the field, having only 10 feet of oil-saturated sand, and having the same acreage as respondent's lease. Such lease under the proposed method of proration would be able to produce daily only one-tenth of the allowable of respondent's lease, which has about 100 feet of sand. This distribution would work fairly if both leases were permitted to produce for the same length of time. However, since respondent's lease will produce much longer than the lease on the west side, the result will be that respondent will produce much more than the recoverable oil beneath its lease, whereas the lease on the west side will have a large part of its oil drained away from it.

The method of proration advocated by the respondent, however, is even more discriminatory against the leases on the west and the east side of the field than in the assumed example, for respondent would have the Commission determine each month the amount of reserves then remaining, and prorate the production on that basis. This would mean not only that the leases in the fairway would have the benefit of their long producing life, but their advantage over the west side and east side

leases would be progressively increased as these other leases were depleted. The effect would be that the man who is presently losing his oil by drainage, would have his hands tied, whereas, the operators in the center of the field, who are suffering no physical depletion, will be given an entirely disproportionate advantage because of their structural location. It was pointed out both by Mr. Cottingham (R. 396-397) and Mr. Hudnall (R. 527) that the use of this method of proration would enable the Rowan & Nichols lease to produce much more oil than was originally in place beneath such lease.

The effect of the decisions of the lower Federal Courts allocating the allowable on a simple ratio would be not only to accentuate the degree of drainage to the fairway leases, but also to give the owners of such leases, such as respondent, a vested right in drainage oil, in conflict with the doctrine of ownership of oil in place and the correlative rights of other owners. In effect, proration would be made the instrument whereby the fairway operators would be guaranteed the opportunity to capture large quantities of oil from less advantageously located producers, who would be effectively prevented from combating drainage of oil from beneath their lands.

Furthermore, the method of proration advocated by respondent would, by eliminating the minimum per-well allowable, result in the confiscation of the property of many operators by so reducing the daily production from many wells as to make it impossible

to operate them. (R. 524) Aside from the waste of oil which would be lost by reason of the premature abandonment of such wells, the effect of such method of proration would be to take oil from some operators and donate it to others. It would be no personal consolation to the owners of leases with small acreage or thin sands to know that at least part of the oil beneath their leases would not be irretrievably lost, but would be recovered by some owner whose lease was larger or more favorably situated.

Compare the language of the Supreme Court of Texas in *Gulf Land Co. v. Atlantic Refining Co.*, 131 S. W. (2d) 73, 80, where, speaking of the duty of the Railroad Commission to permit every owner to recover his fair share of the oil, the court said:

"It is the law that every owner or lessee of land is entitled to a fair chance to recover the oil and gas in or under his land, or their equivalents in kind. *Any denial of such fair chance would be 'confiscation' within the meaning of Rule 37 and the Rule of May 29th.*" (Emphasis added).

## CONCLUSION

The decisions of the lower courts not only set aside the orders of the Railroad Commission properly within its administrative discretion, but require the setting up of a plan of proration which would result in a redistribution of property rights in a vast oil field contrary to the property law of Texas. For the reasons stated, it is respectfully submitted that the

judgment of the Circuit Court of Appeals for the Fifth Circuit, affirming the judgment of the District Court for the Western District of Texas, should be reversed.

Respectfully submitted,

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## APPENDIX

### Texas Statutes Relevant to this Appeal

(All Statutes Listed Below are Included in Texas Revised Civil Statutes, 1925, or Amendments as Indicated, and are Compiled in Volume 17 of Vernon's Annotated Civil Statutes of Texas)

#### Art. 6014. "Waste"

The production, storage or transportation of crude petroleum oil or of natural gas in such manner, in such amount, or under such conditions as to constitute waste is hereby declared to be unlawful and is prohibited. The term "waste" among other things shall specifically include:

(a) The operation of any oil well or wells with an inefficient gas-oil ratio, and the Commission is hereby given authority to fix and determine by order such ratio; provided that the utilization for manufacture of natural gasoline of gas produced from an oil well within the permitted gas-oil ratio shall not be included within the definition of waste.

(b) The drowning with water of any stratum or part thereof capable of producing oil or gas, or both oil and gas, in paying quantities.

(c) Underground waste or loss however caused and whether or not defined in other subdivisions hereof.

(d) Permitting any natural gas well to burn wastefully.

(e) The creation of unnecessary fire hazards.

(f) Physical waste or loss incident to, or resulting from, so drilling, equipping, locating, spacing or operating well or wells as to reduce or tend to reduce the total ultimate recovery of crude petroleum oil or natural gas from any pool.

(g) Waste or loss incident to, or resulting from, the unnecessary, inefficient, excessive or improper use of the reservoir energy, including the gas energy or water drive, in any well or pool; however, it is not the intent of this Act to require repressuring of an oil pool or that the separately owned properties in any pool be unitized under one management, control or ownership.

(h) Surface waste or surface loss, including the storage either permanent or temporary of crude petroleum oil, or the placing any product thereof, in open pits or earthen storage, and all other forms of surface waste or surface loss, including unnecessary or excessive surface losses, or destruction without beneficial use, either of crude petroleum oil or of natural gas.

(i) The escape into the open air, from a well producing both oil and gas, of natural gas in excess of the amount which is necessary in the efficient drilling or operation of the well.

(j) The production of crude petroleum oil in excess of transportation or market facilities or reason-

able market demand. The Commission may determine when such excess production exists or is imminent and ascertain the reasonable market demand.

The Commission may consider any or all of the above definitions, whenever the facts, circumstances or conditions make them applicable, in making rules, regulations or orders to prevent waste of oil or gas.

Nothing in this Section shall be construed to authorize limitation of production of marginal wells, as such marginal wells are defined by Statute, below the amount fixed by Statute for such wells. (Acts 1919, p. 285; Acts 1929, 41st Leg., p. 694, ch. 313, Acts 1931, 42nd Leg., 1st C. S., p. 46, ch. 26, par. 1; Acts 1932, 42nd Leg., 4th C. S., p. 3, ch. 2, par. 1; Acts 1935, 44th Leg., p. 180, ch. 76, par. 2.)

#### **Art. 6029. Rules and regulations**

The Commission shall make and enforce rules, regulations or orders for the conservation of crude petroleum oil and natural gas and to prevent the waste thereof, including rules, regulations or orders for the following purposes:

(1) To prevent the waste, as hereinbefore defined, of crude petroleum oil and natural gas in drilling and producing operations and in the storage, piping and distribution thereof.

(2) To require dry or abandoned wells to be plugged in such way as to confine crude petroleum oil, natural gas, and water in the strata in which

they are found and to prevent them from escaping into other strata.

(3) For the drilling of wells and preserving a record thereof.

(4) To require wells to be drilled and operated in such manner as to prevent injury to adjoining property.

(5) To prevent crude petroleum oil and natural gas and water from escaping from the strata in which they are found into other strata.

(6) To establish rules and regulations for shooting wells and for separating crude petroleum oil from natural gas.

(7) To require records to be kept and reports made.

(8) It shall do all things necessary for the conservation of crude petroleum oil and natural gas and to prevent the waste thereof, and shall make and enforce such rules, regulations or orders as may be necessary to that end.

(9) To provide for the issuance of permits, tenders, and other evidences of permission when the issuance of such permits, tenders, or permission is necessary or incident to the enforcement of its rules, regulations, or orders for the prevention of waste. (Acts 1919, p. 285; Acts 1931, 42nd Leg., 1st C. S.,

p. 46, ch. 26, par. 15; Acts 1932, 42nd Leg., 4th C. S., p. 3, ch. 2, par. 7; Acts 1935, 44th Leg., p. 180, ch. 76, par. 4.)

#### **Art. 6042. Powers not limited**

Particular powers herein granted to the Commission shall not be construed to limit the general powers conferred by law, and until set aside or vacated by some order or decree of a court of competent jurisdiction, all orders of the Commission as to any matter within its jurisdiction shall be accepted as prima facie evidence of their validity.

#### **Art. 6049b. Marginal wells defined; curtailing production**

Sec. 1. The term "Marginal Well" as used herein means a pumping oil well capable, under normal unrestricted operating conditions, of producing such daily quantities of oil as herein set out as would be damaged, or result in a loss of production ultimately recoverable, or cause the premature abandonment of same, if its daily production were artificially curtailed. The following described wells shall be deemed "Marginal Wells" in this State:

(a) Any pumping oil well within this State having a daily capacity for production of ten (10) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a depth of two thousand (2,000) feet or less:

(b) Any pumping oil well within this State having a daily capacity for production of twenty (20) barrels or less, averaged over the preceding thirty (30) consecutive days producing from a horizon deeper than two thousand (2,000) feet and less in depth than four thousand (4,000) feet:

(c) Any pumping oil well within this State having a daily capacity for production of twenty-five (25) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a horizon deeper than four thousand (4,000) feet and less in depth than six thousand (6,000) feet:

(d) Any pumping oil well within this State having a daily capacity for production of thirty (30) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a horizon deeper than six thousand (6,000) feet and less in depth than eight thousand (8,000) feet:

(e) Any pumping oil well within this State having a daily capacity for production of thirty-five (35) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a horizon deeper than eight thousand (8,000) feet. (As amended Acts 1933, 43rd Leg., p. 215, ch. 97.)

Sec. 2. To artificially curtail the production of any "Marginal Well" below the marginal limit as set out above prior to its ultimate plugging and abandonment is hereby declared to be waste, and no rule or order of the Railroad Commission of Texas, or



other constituted legal authority, shall be entered requiring restriction of the production of any "Marginal Well" as herein defined. (Acts 1931, 42nd Leg., p. 92, ch. 58.)

**Art. 6049c. Oil and gas conservation, powers and duties of Railroad Commission**

**Powers and duties of Railroad Commission**

Sec. 5. The Commission shall have the power, and it shall be its duty, from time to time to inquire into the production, storage, transportation, refining, reclaiming, treating, marketing or processing of crude petroleum oil and natural gas, and the reasonable market demand therefor, in order to determine whether or not waste exists or is imminent, or whether the oil and gas conservation laws of Texas or the rules, regulations, or orders of the Commission promulgated thereunder are being violated. . . . .  
(As amended Acts 1932, 42nd Leg., 4th C. S., p. 3, ch. 2, par. 3; Acts 1934, 43rd Leg., 2nd C. S., p. 104, ch. 45, par. 1; Acts 1935, 44th Leg., p. 180, ch. 76, par. 5.)

**Hearing by Commission as to waste**

Sec. 7. Upon the initiative of the Commission, or upon the verified complaint of any person interested in the subject matter, that waste of crude petroleum

oil or natural gas is taking place in this State, or is reasonably imminent, the Commission may hold a hearing, at such time and place as it may fix, to determine whether or not waste is taking place, or is reasonably imminent and what, if any, rule, regulation, or order should be made or what, if any, other action should be taken to correct, prevent or lessen such waste. At said hearing all parties interested shall be entitled to be heard and introduce evidence and to require the attendance of witnesses, and the production of evidence may be required as provided by law. If upon the hearing the Commission shall find that waste is taking place, or is reasonably imminent, the Commission shall make such rule, regulation or order as in its judgment is reasonably required to correct, prevent or lessen such waste.

In the event any such rule, regulation or order which the Commission may adopt provides for the limitation or fixing of the production of crude petroleum oil, or of natural gas from wells producing gas only, in any pool or portion thereof, the Commission shall distribute, prorate, or otherwise apportion or allocate, the allowable production among the various producers on a reasonable basis.

From and after the promulgation of any rule, regulation or order of the Commission it shall be the duty of each person affected thereby to comply with the same. (As amended Acts 1932, 42nd Leg., 4th C. S., p. 3, ch. 2, par. 5; Acts 1935, 44th Leg., p. 180, ch. 76 par. 6.)

Suits authorized by persons aggrieved by  
Commission's regulations or orders

Sec. 8. Any interested person affected by the conservation laws of this State relating to crude petroleum oil or natural gas, and the waste thereof, including this Act, or by any rule, regulation or order made or promulgated by the Commission thereunder, and who may be dissatisfied therewith, shall have the right to file a suit in a Court of competent jurisdiction in Travis County, Texas, and not elsewhere, against the Commission, or the members thereof, as defendants, to test the validity of said laws, rules, regulations or orders. Such suit shall be advanced for trial and be determined as expeditiously as possible and no postponement thereof or continuance shall be granted except for reasons deemed imperative by the Court. In all such trials, the burden of proof shall be upon the party complaining of such laws, rule, regulation or order; and such laws, rule, regulation or order so complained of shall be deemed prima facie valid. (As amended Acts 1932, 42nd Leg., 4th C. S., p. 3, ch. 2, par. 8; Acts 1935, 44th Leg., p. 180, ch. 76, par. 14.)

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CHARLES ELMORE TROPLEY  
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# **SUPREME COURT OF THE UNITED STATES**

OCTOBER TERM, 1939

\_\_\_\_\_  
NO. 681  
\_\_\_\_\_

RAILROAD COMMISSION OF TEXAS ET AL.,  
Petitioners

v.

ROWAN & NICHOLS OIL COMPANY,  
Respondents  
\_\_\_\_\_

## **REPLY BRIEF FOR PETITIONERS**

\_\_\_\_\_

On Writ of Certiorari to the United States Circuit  
Court of Appeals for the Fifth Circuit

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# **SUPREME COURT OF THE UNITED STATES**

OCTOBER TERM, 1939

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NO. 681

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RAILROAD COMMISSION OF TEXAS ET AL.,  
Petitioners

v.

ROWAN & NICHOLS OIL COMPANY,  
Respondents

---

## **REPLY BRIEF FOR PETITIONERS**

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I.

### **Reply to Respondent's "Statement in Respect to Jurisdiction"**

In respondent's brief, (p. 1) attention is called to the fact that the Railroad Commission, after the perfection of the appeal in this case to the Circuit Court of Appeals, promulgated and is now enforcing proration orders for the East Texas field "which are substantially different from the order and plan of proration involved in this case." Without saying so explicitly, respondent intimates that the case has

become moot because of the promulgation and enforcement of the new orders. In order that the court may be acquainted with the facts as to the promulgation of the new orders, if it considers them to be relevant to this appeal, we state them briefly below.

(1) *Change in proration orders.*

This case was tried from February 6, 1939, through February 10, 1939, but the final judgment was not entered until June 14, 1939. (R. 76, 78) A motion for stay of judgment was presented by the Railroad Commission on June 14, 1939, (R. 79) which was overruled by the District Court (R. 83) Notice of appeal was given on June 19, 1939, (R. 83) A motion for a stay was then presented to the Circuit Court of Appeals and was denied by that court. The proceedings on this motion before the Circuit Court of Appeals are omitted from the record.

Soon after the judgment of the District Court was entered in this action, numerous petitions were filed by operators of extensive properties in the East Texas oil field for an increase in their allowables. The Railroad Commission called a hearing for August 16, 1939, with reference to the question of the modification of the proration orders relating to the East Texas oil field, and particularly as to the application of Humble Oil & Refining Company for an increase in the allowables on its properties. Before this hearing could be held, on July 26, 1939, Humble Oil & Refining Company filed its suit in the United

States District Court for the Western District of Texas, being Civil Action No. 31, entitled *Humble Oil & Refining Company v. Railroad Commission of Texas, et al.*, asking for interlocutory and final injunctive relief against the enforcement of the proration orders of the Railroad Commission and particularly the order of June 19, 1939, which was substantially the same as the order involved in this case. A hearing was held before a three-judge District Court at San Antonio, Texas, on August 10, 1939, and on August 11, 1939, the three-judge District Court issued a preliminary injunction enjoining the Railroad Commission from enforcing its proration orders against the properties of the Humble Oil & Refining Company, which then operated about 2,545 wells scattered throughout the East Texas oil field.

Upon the granting of the temporary injunction by the three-judge District Court in the Humble case, the Railroad Commission was faced with the choice of either allowing the field to be prorated by injunction, or of adopting some different order which could be enforced until a final determination of the appeal in the Rowan & Nichols Oil Company case could be obtained. The properties of Humble Oil & Refining Company were so extensive that it was not possible to operate the field under any method of regulation which could not be applied to such properties. On August 15, 1939, the Railroad Commission of Texas issued an order shutting down completely the entire East Texas oil field for a period of fifteen days. On August 16, 1939, and for several days thereafter the Railroad Commission

held its hearing with reference to the application of Humble Oil & Refining Company for an increase in allowables on its wells. On September 11, 1939, the Railroad Commission of Texas adopted a proration order, which kept the 20 barrel per well base or minimum allowable, but which raised the total daily field allowable to 690,000 barrels, as compared with the previous daily field allowable of 522,000 barrels, and which prorated the excess of the field allowable above the 20-barrel base or minimum allowable on the factors of well potential, sand thickness, acreage and bottomhole pressure.

The Humble Oil & Refining Company was not satisfied with the change in the proration order adopted by the Railroad Commission, and on October 3, 1939, filed its supplemental complaint praying for a second interlocutory injunction on the ground that the new order of September 11, 1939, was substantially the same as the order of June 19, 1939. On November 10, 1939, a three-judge District Court denied the application of Humble Oil & Refining Company for a second interlocutory injunction on the ground that the Humble Oil & Refining Company did not show any irreparable injury from the application of the proration order of September 11, 1939, and renewals thereof.

The trial on the merits in the Humble case came up on February 13, 1940, and was heard jointly with an attack on the new order by Rowan & Nichols Oil Company, being Civil Action No. 46, entitled *Rowan & Nichols Oil Company v. Railroad Commis-*

sion of Texas, et al. On February 21, 1940, the court indicated that it would enter a permanent injunction in favor of the plaintiffs enjoining the proration orders of the Railroad Commission, unless the Commission submitted to the judgment of the court and indicated within ten days that it would not appeal the case. On March 1, 1940, the Railroad Commission stated to the court that it would appeal the Humble case, as well as the second Rowan & Nichols case, and the Commission then applied to the court for a stay of the injunction pending the appeal. On March 11, 1940, the Supreme Court granted a writ of certiorari in this case. On March 14, 1940, the three-judge District Court was reconvened at Houston, Circuit Judge Sibley and District Judge McMillan sitting, and it was then announced that in view of the action of the Supreme Court in granting a writ of certiorari in this case, the motion for a stay pending appeal would be granted in the Humble case and also in the second Rowan & Nichols case. On March 19, 1940, a judgment was entered in the Humble case, granting a permanent injunction, but staying the execution of the injunction until sixty days after the date of the judgment. A judgment has not yet been entered in the second Rowan & Nichols case, although the District Court has stated that it will enter judgment against the Railroad Commission in that case.

On April 1, 1940, a petition for appeal was presented and allowed in the *Humble* case, and this case has been docketed in this court as case No. , entitled *Railroad Commission of Texas et al., Ap-*

*pellants, v. Humble Oil & Refining Company, Appellee.*

From the foregoing facts, it is apparent that the change in the proration order by the Railroad Commission of Texas was made under the pressure of a temporary injunction issued by the three-judge District Court on August 11, 1939, and in the face of the certain disruption of the East Texas field if some such step was not taken by the Railroad Commission to provide for the uniform regulation of the field. The Railroad Commission has excepted the Rowan & Nichols Oil Company property from the operation of the new orders and has at all times done everything within its power to have the determination of the validity of the proration orders involved in this case finally determined by this Court.

(2) *Reasons why the present appeal has not become moot because of the change in the proration orders.*

(a) The respondent in the District Court prayed, not merely for an injunction against the specific proration order of August 29, 1938, but also for an injunction against "any and all similar monthly proration orders and schedules for the East Texas Field; and further enjoining the Railroad Commission from enforcing against the Complainant any rules and orders governing and providing for the prorating of oil in the East Texas Field that deny the Complainant a right to produce that proportion of the total daily allowable that the recov-



erable oil under its lease bears to the total recoverable oil in the East Texas Field. . . .". (R. 14)

(b) It was agreed by the parties that "it would be unnecessary to amend to cover the orders subsequently entered continuing the same plan of proration." (R. 64, 666-667)

(c) The judgment of the court not only enjoined the Railroad Commission specifically from enforcing the orders of August 29, 1938, and December 14, 1938, but also enjoined the Commission from enforcing or attempting to enforce "any such plan of proration or allocation of field allowable among wells as said orders have been interpreted by the Railroad Commission to require," and further permanently enjoined the Railroad Commission "from interfering with complainant in daily producing from the wells on its said lease (except on such days as the entire East Texas oil field may be, by valid order of the Railroad Commission, prohibited from producing) that amount of oil which bears to the daily allowable fixed by the Railroad Commission the ratio which 220 barrels bears to 522,000 barrels." (R. 78)

(d) Under the court's injunction, the Rowan & Nichols Oil Company has produced daily an amount of oil approximately double the amount permitted under the orders of the Railroad Commission attacked in this case and also an amount in excess of the amount which would be permitted under the orders of September 11, 1939, and succeeding or-

ders, if they had been enforced against the property of the plaintiff. The question remains undecided as to whether this oil has been legally produced, and whether the Commission, if the judgments of the lower courts below are reversed, would not be allowed to adjust the future production from the Rowan & Nichols oil lease in order to account for the excess that has been produced under the court's injunction.

(e) The Railroad Commission of Texas is a continuing administrative body, and its powers to prorate and regulate the production of oil in the East Texas field are also continuing. The validity of the proration orders involved in this case is a question of great public importance which should be settled for the future guidance of the Railroad Commission. The Railroad Commission has not renounced any intention of promulgating similar orders in the future, but has at all times endeavored to have the validity of such orders finally adjudicated so that it may be guided in its future orders.

The change in the proration orders, under the circumstances stated above, does not render this appeal moot. *United States v. Trans-Missouri Freight Association*, 166 U. S. 290; *Southern Pacific Company v. Interstate Commerce Commission*, 219 U. S. 433; *Southern Pacific Terminal Company v. Interstate Commerce Commission*, 219 U. S. 498; *McGrain v. Daugherty*, 273 U. S. 135; *Leonard v. Earle*, 279 U. S. 392; *Newport News Shipbuilding and Dry Dock Company v. Schauffler*, 303 U. S. 54;

*United States v. Rock Royal Co-operative, Inc.*, 307  
U. S. 533.

## II.

Under Rule 52 of the Rules of Civil Procedure, it was not necessary that petitioners except to the findings of fact or request that they be changed or that additional findings be made in order to challenge the sufficiency of the evidence to support the judgment of the District Court.

On page 3 of its brief, respondent points out that the petitioners did not except to the findings of fact by the court, or request that they be changed or that additional findings be made. The necessity for such exceptions, objections or requests was expressly eliminated by the provisions of Rule 52 of the Rules of Civil Procedure.

Under Rule 52 (a) it is provided that, "Requests for findings are not necessary for purposes of review."

Under Rule 52 (b) it is provided, "When findings of fact are made in actions tried by the court without a jury, the question of the sufficiency of the evidence to support the findings may thereafter be raised whether or not the party raising the question has made in the District Court an objection to such findings or has made a motion to amend them or a motion for judgment."

The petitioners, having made proper assignments of error attacking the holdings of the lower courts to the effect that the proration orders of the Railroad Commission are arbitrary and unreasonable and that the respondent showed itself to be injured thereby, are entitled to challenge the sufficiency of the evidence to support the findings upon which the judgment is based. Compare *Hill v. Ohio Casualty Insurance Company*, 6 Cir., 104 F. (2d) 695, 696; *Jackson County v. Alton Railroad Company*, 8 Cir., 105 F. (2d) 633, 639 (cer. den. 84 L. ed. 134); *Stoltz v. United States*, 9 Cir., 99 F. (2d) 283, 284; *Anglo California National Bank v. Lazard*, 9 Cir., 106 F. (2d) 693, 706.

Respectfully submitted

GERALD C. MANN

Attorney General of Texas

JAMES P. HART

Assistant Attorney General  
Attorneys for Petitioners  
Austin, Texas.

**ACKNOWLEDGMENT OF SERVICE  
OF REPLY BRIEF**

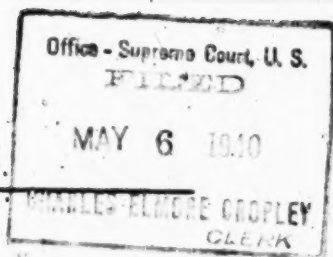
Service of the foregoing reply brief is acknowledged this      day of April, 1940.

Attorney for Respondent, Rowan  
Nichols Oil Company





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# Supreme Court of the United States

OCTOBER TERM, 1939

NO. 681

RAILROAD COMMISSION OF TEXAS ET AL.

Petitioners

v.

ROWAN & NICHOLS OIL COMPANY

Respondent

## MEMORANDUM BRIEF FOR PETITIONERS

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# Supreme Court of the United States

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NO. 681

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RAILROAD COMMISSION OF TEXAS ET AL.

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v.

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Respondent

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## MEMORANDUM BRIEF FOR PETITIONERS

Petitioners have already filed, on April 22, 1940, their reply brief, in which (on pages 1-9) they set out their reasons for believing that the case has not become moot because of the change in the proration orders of the Railroad Commission. This memorandum is intended to be supplementary to such reply brief.

Petitioners concede that there have been substantial changes in the proration orders of the Railroad Commission of Texas as applied to the East Texas field, beginning with the order of September 11, 1939. The total field allowable has been raised to about 690,000 barrels, as compared with about 522,000 barrels under the old orders. This has resulted in an increase in the "proratable" oil (that is, the oil

in excess of the 20-barrel per well base or minimum allowable and the allowable of the marginal wells) to about 176,000 barrels, as compared with only about 7,000 barrels of "proratable" oil under the old orders. Instead of being allocated purely on the basis of well potential as under the old orders, the "proratable" oil is now allocated on the factors of sand thickness, acreage and bottomhole pressure, in addition to well potential. The result in this change in the method of allocation has been that the leases in the fairway have received substantial increases in their allowables. As shown by the stipulation on file, the Rowan & Nichols Oil Company's lease under the new orders would be entitled to receive a daily allowable of about 205.44 barrels daily as compared with 111.83 barrels daily under the old orders.

In the following important respects, however, the new orders contain the same features as the old orders:

(1) The 20-barrel base or minimum allowable per well is retained. This is the chief object of attack by the respondent.

(2) The Commission in the new orders continues to refuse to prorate on a simple ratio of current reserves. It still insists that it is entitled to consider in allocating the allowable other factors, including the producing life of various portions of the field and the property rights of owners of wells drilled under the supervision of the Railroad Commission. The Railroad Commission still refuses to

concede that the respondent is entitled to measure its share in the common reservoir and in the daily allowable on the basis of "recoverable oil," which includes oil to be drained from other leases. (R. 308)

(3) Under the method of proration advocated by respondent and endorsed by the lower courts, the respondent has produced since the effective date of the order of September 11, 1939, approximately 290.8 barrels of oil daily, whereas under the present proration orders it would be entitled to produce only about 205.44 barrels daily. The respondent, although receiving a substantial increase in its daily allowable under the new orders, would not receive under such orders the proportion of the total daily field allowable which it has been receiving under the injunction.

Petitioners concede that the changes in the method of proration are substantial and that they were made by the Railroad Commission after hearing and in the belief that they are fair and reasonable. However, petitioners submit that, for the reasons set out on pages 6-9 of our reply brief, this case has not become moot.

*United States v. Trans-Missouri Freight Association*, 166 U. S. 290

*Southern Pacific Company v. Interstate Commerce Commission*, 219 U. S. 433

*Southern Pacific Terminal Company v. Interstate Commerce Commission*, 219 U. S. 498

*McGrain v. Daugherty*, 273 U. S. 135  
*Leonard v. Earle*, 279 U. S. 392  
*Newport News Shipbuilding and Dry Dock Company v. Shauffler*, 303 U. S. 54  
*United States v. Rock Royal Co-operative, Inc.*,  
307 U. S. 533  
*Panama Refining Company v. Ryan*, 293 U. S.  
388  
*Robertson & Kirkham, Jurisdiction of the Supreme Court of the United States*, Section 263.

In the event that the court should decide that this case has become moot, we submit that the judgment should be reversed with directions to dismiss the complaint, without prejudice to the right of the Railroad Commission to promulgate and enforce similar proration orders in the future. Otherwise, the judgment of the Circuit Court of Appeals, modifying and affirming the judgment of the District Court, would be construed to constitute an adjudication against the right of the Railroad Commission to promulgate and enforce proration orders similar to those attacked in this case.

*United States v. Hamburg-Amerikanische Packet-Fahrt-Actien Gesellschaft*, 239 U. S. 466  
*Brownlow v. Schwartz*, 261 U. S. 216  
*Alejandrino v. Quezon*, 271 U. S. 528  
*Norwegian Nitrogen Products Co. v. Tariff Commission*, 274 U. S. 106  
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Respectfully submitted,

GERALD C. MANN  
Attorney General of Texas

---

JAMES P. HART  
Assistant Attorney General  
Austin, Texas  
Attorneys for Petitioners

## ACKNOWLEDGMENT OF SERVICE

Service of the foregoing memorandum brief for  
petitioners is acknowledged this \_\_\_\_\_ day of May,  
1940.

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Attorney for Respondent,  
Rowan & Nichols Company

STIPULATION

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# Supreme Court of the United States

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\_\_\_\_\_  
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# SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1939

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NO. 681

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RAILROAD COMMISSION OF TEXAS, ET AL.,  
Petitioners

VS.

ROWAN & NICHOLS OIL COMPANY,  
Respondent

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## STIPULATION

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The parties to the above entitled and numbered case stipulate as follows:

Following the entry of the final judgment of the District Court in this case on June 14, 1939 (R. 76) applications for increases in allowables were filed with the Railroad Commission of Texas by numerous operators. On August 4, 1939, the Railroad Commission of Texas issued notice that it would on August 16, 1939, hold a hearing with reference to whether or not there should be an increase in allowables and a change in the proration order for the East Texas field.

On July 26, 1939, Humble Oil & Refining Company filed its suit in the United States District Court for the Western District of Texas, Civil Action No. 31, *Humble Oil & Refining Company v. Railroad Commission of Texas et al.*, (now on appeal in this court as case No. 930, *Railroad Commission of Texas et al.*, appellants v. *Humble Oil & Refining Company*), praying for interlocutory and final injunctive relief against the enforcement of the proration orders of the Railroad Commission, and particularly the order of June 19, 1939, which had been enforced to result in substantially the method of proration involved in this case. A hearing was held before a three-judge District Court at San Antonio, Texas, on August 10, 1939, and on August 11, 1939, the three-judge District Court issued a preliminary injunction enjoining the Railroad Commission from enforcing its proration orders against the properties of the Humble Oil & Refining Company, which then operated about 2,545 wells scattered throughout the East Texas oil field.

On August 15, 1939, the Railroad Commission of Texas issued an order shutting down completely the entire East Texas oil field for a period of fifteen days. On August 16, 1939, and for several days thereafter, the Railroad Commission held its hearing with reference to the application of Humble Oil & Refining Company for an increase in the allowables on its wells.

On September 11, 1939, the Railroad Commission of Texas adopted a proration order for the



East Texas oil field, raising the total field allowable to 690,000 barrels daily, and prorating the oil above the base or minimum allowable of 20 barrels per well on the factors shown in paragraph (b) 3 of Rule 23 of the order of September 11, 1939, a copy of which is attached hereto and marked "Exhibit A." (*Infra*, p. 6)

On September 12, 1939, the Railroad Commission issued an order exempting the Rowan & Nichols Oil Company's lease involved in this case from the enforcement of the proration order of September 11, 1939, a copy of said excepting order being attached hereto and marked "Exhibit B." (*Infra*, p. 11) The Railroad Commission of Texas has not enforced the order of September 11, 1939, or other orders continuing substantially the same method of proration, against the Rowan & Nichols Oil Company's said lease.

The method of proration for the East Texas oil field as set forth in the order of September 11, 1939, has been substantially continued by the Railroad Commission of Texas for each month thereafter, the latest order being the order of April 25, 1940, effective for the month of May, 1940, a copy of the portion of said order pertaining to the East Texas oil field being attached hereto and marked "Exhibit C." (*Infra*, p. 13)

At the same time that the Commission promulgated the above proration order it also promulgated an order requiring the shutdown of wells in the field

on certain days during the month of May, 1940; a copy of said order being attached hereto and marked "Exhibit D." (*Infra*, p. 16)

Under the proration order of September 11, 1939, and later orders continuing the same method of proration, the total daily field allowable of about 690,000 barrels of oil per day was divided on approximately the following basis: about 6,200 barrels daily were allocated to the approximately 530 wells which were incapable of producing as much as 20 barrels per day, and which were allowed to produce to their full capacity; about 509,000 barrels were allocated to the remaining wells in the field on the basis of 20 barrels per well per day, and about 176,000 barrels were allocated to such wells on the application of the factors set out in paragraph (b) 3 of Rule 23. (See "Exhibit A." *infra*, p. 10) of well potential, sand thickness, acreage, and bottomhole pressure.

Under the method of proration attacked by the Rowan & Nichols Oil Company in this case it was permitted to produce daily from the five wells on the lease involved in this case a total of 111.83 barrels per day. Under the judgment of the District Court, the Rowan & Nichols Oil Company has produced daily an amount of oil which is in the same proportion to the total daily field allowable as 220 barrels is to 522,000 barrels.

Up to the effective date of the order of September 11, 1939, the respondent produced oil at the rate

-5-

of about 220 barrels per day from its said lease. Since the effective date of the order of September 11, 1939, the Rowan & Nichols Oil Company has produced about 290.8 barrels of oil per day from its said lease. If the order of the Railroad Commission of Texas of September 11, 1939, and the renewals thereof had been enforced to control production from respondent's lease, respondent would have been allowed to produce about 205.44 barrels per producing day from its five wells on said lease, on producing days when the field was allowed to produce.

Since the entry of the judgment of the District Court on June 14, 1939, the respondent has produced under the court's injunction approximately 15,000 barrels of oil in excess of the amount of oil which it would have been permitted to produce under the proration orders of the Railroad Commission in effect since said date.

After the promulgation of the order of September 11, 1939, Rowan & Nichols Oil Company filed another suit, being Civil Action No. 46, entitled *Rowan & Nichols Oil Company v. Railroad Commission of Texas et al.*, in which Rowan & Nichols Oil Company attacked the method of proration established by the order of September 11, 1939, and renewals thereof, as applied to a different lease from the lease involved in this case. The grounds of attack were substantially the same as the grounds of attack on the method of proration in this case. Said Civil Action No. 46 was tried jointly with Civil

Action No. 31, entitled *Humble Oil & Refining Company v. Railroad Commission of Texas et al.*, (now on appeal in this court as case No. 930, *Railroad Commission of Texas, et al.*, Appellants, v. *Humble Oil & Refining Company*), and the District Court has announced that it will enter judgment in Civil Action No. 46 in favor of Rowan & Nichols Oil Company. The defendants in said action intend to appeal from the judgment in said action to the Supreme Court of the United States.

This stipulation shall not be used by any party or admitted in evidence in any other suit or proceeding.

Dated this       day of       , 1940.

Attorney for Petitioners

Attorneys for Respondent

"EXHIBIT A"

RAILROAD COMMISSION OF TEXAS  
OIL AND GAS DIVISION

OIL AND GAS DOCUMENT NOS. 108, 120, 123, 124, 125, 126, 128, 129, 132 and 146

IN RE: Conservation and Prevention of Waste of Crude Petroleum and Natural Gas in the State of Texas

Austin, Texas

September 11, 1939

SPECIAL ORDER FIXING THE ALLOWABLE PRODUCTION OF CRUDE OIL IN THE EAST TEXAS FIELD FOR THE MONTHS OF SEPTEMBER AND OCTOBER, 1939, AND AMENDING RULE 23, DIVISION 3, OF THE COMMISSION'S ORDER OF OCTOBER 17, 1933, PERTAINING TO THE EAST TEXAS FIELD

WHEREAS, The Railroad Commission of Texas, after due notice and hearing on October 17, 1933, promulgated a general order pertaining to the conservation and regulation of crude oil and natural gas for the State of Texas, which included Rule 23 of Division 3, pertaining to the East Texas Field, which provided in part that each oil well in the East Texas Field should be allowed to produce daily a certain maximum percentage of its hourly potential capacity as determined by the Commission, and

WHEREAS, The Commission through subsequent amendments to Rule 23, of Division 3, of the Order of October 17, 1933, has continued to distribute the allowable for the East Texas Field between producing wells on the basis set forth in said Rule, and

WHEREAS, The method of allocation of the allowable production of the East Texas Field has been recently attacked in the Courts and the Commission has been restrained from enforcing the provisions of said Rule as it applies to certain properties in the East Texas Field, and

WHEREAS, The Commission finds that it is

necessary to revise the method of allocation and distribution of the allowable oil in the East Texas Field as has been enforced and applied and to amend Rule 23 of Division 3 of the Order of October 17, 1933, in order to conform to certain standards of distribution of the allowable crude oil production between the wells in the East Texas Field as indicated as being necessary by the Courts, and

WHEREAS, The Commission, after due notice, held a hearing in Austin, Texas, called for August 16, 1939, relating to the conservation of crude oil and natural gas in the East Texas Field and the prevention of the waste thereof, at which hearing the Commission heard extensive testimony on the proper factors which should be included in an equitable distribution of the allowable production between the producing wells in the East Texas Field and regulations necessary for the prevention of waste in said Field, and

WHEREAS, The Commission finds from the evidence submitted at its hearings that in order for each producing well to be allowed to produce its fair share of the allowable oil from the East Texas Field, that the method of allocation and distribution of the field's allowable between producing wells in this field should, in order to prevent waste, incorporate a minimum well allowable, the potential capacity of the wells on each lease, the number of acre feet of oil saturated sand underlying the wells on each tract and the bottom-hole pressure of the wells located on each tract, and



WHEREAS, The Commission finds from evidence submitted to it at numerous hearings, including the hearing of August 16, 1939, that the reservoir of the East Texas Field has its energy principally supplied by a hydrostatic drive which encroaches from the west to the east and that only a certain amount of crude oil can be withdrawn daily from the East Texas Field in order to utilize effectively the energy necessary to recover the greatest amount of oil ultimately from the reservoir, and

WHEREAS, The Commission finds that in order to prevent waste in said field that the allowable production during the months of September and October, 1939, should not average more than 490,000 barrels per day over a thirty (30) day period, and that not more than 690,000 barrels of crude oil should be produced from the East Texas Field in any one day during the months of September and October, 1939, and

WHEREAS, The Commission finds that there exists a market demand for crude oil produced in such an amount in the East Texas Field during the months of September and October, 1939:

IT IS THEREFORE ORDERED That Rule 23, of Division 3, of the Commission's Order of October 17, 1933, pertaining to the East Texas Field be and it is hereby amended to read, effective September 14, 1939, as follows:

"RULE 23. (a) Not more than 690,000 bar-

rels of crude oil shall be produced from the East Texas Field during any day of the effective period of this Order.

“(b) The total daily allowable for the field shall be distributed among the producing wells in the field on the following basis:

1. Each well capable of producing twenty (20) barrels of crude oil per day shall be allowed to produce twenty (20) barrels per day.

2. Each well incapable of producing twenty (20) barrels per day shall be allowed to produce daily that amount of oil which it is capable of producing in a 24-hour period, not in excess of twenty (20) barrels.

3. In addition to the twenty (20) barrels provided for in one (1) above, each well in the field which is capable of producing in excess of twenty (20) barrels daily shall be allowed to produce daily that proportion of the total daily allowable for the field remaining after deductions for one (1) and two (2) above have been made, that the product of such well's hourly potential by its bottom-hole pressure by the thickness of the saturated Woodbine Sand underlying the well by the average number of acres per well in the lease bears to the sum of such products for all of the wells in the field.”

IT IS FURTHER ORDERED, By the Railroad Commission that the owner of any oil and/or gas leasehold estate in the East Texas Oil Field shall have the right to present evidence to the Commission

and be heard thereon on the question of the amount of acreage owned, the potential of his well or wells thereon, or the bottom-hole pressure or pressures of any well or wells on said leasehold estate, or the number of feet of saturated oil sand underlying any of said leases.

IT IS FURTHER ORDERED That this cause be held open on the docket for such other and further orders as may be necessary and supported by evidence of record.

RAILROAD COMMISSION  
OF TEXAS

Lon A. Smith, Chairman

Jerry Sadler, Commissioner

(SEAL)

ATTEST:

C. F. Petet, Secretary

"EXHIBIT B"

RAILROAD COMMISSION OF TEXAS  
OIL AND GAS DIVISION

OIL AND GAS  
DOCKET NO. 120  
No. 6-866

IN RE: Conservation and  
prevention of waste of crude  
petroleum and natural gas  
in the East Texas Field  
Austin, Texas  
September 12, 1939

ORDER FIXING THE PORTION OF THE TOTAL  
ALLOWABLE FOR THE EAST TEXAS FIELD  
WHICH THE ROWAN AND NICHOLS OIL  
COMPANY WILL BE ALLOWED TO PRO-  
DUCE FROM ITS TODD "B" LEASE,  
GREGG COUNTY, TEXAS

WHEREAS, In Cause No. 624 in Equity in the District Court of the United States for the Western District of Texas, Austin Division, entitled *Rowan and Nichols Oil Company*, Complainant v. *Railroad Commission of Texas, et al.*, Respondents, the said court on June 14, 1939, entered its decree containing the following provision, to wit:

"Respondents, their agents, servants, employees and representatives are restrained from interfering with complainant in daily producing from the wells on its said lease, except on such days as the entire East Texas Oil Field may be, by valid order of the Railroad Commission, prohibited from producing, that amount of oil which bears to the daily field allowable fixed by the Railroad Commission the ratio which 220 barrels bears to 522,000 barrels":

WHEREAS, The Railroad Commission of Texas and the other respondents in the above entitled and numbered cause have taken an appeal from said decree to the United States Circuit Court of Appeals for the Fifth Circuit, in which said appeal said respondents are praying that said decree be set aside or modified.

IT IS HEREBY ORDERED By the Railroad

Commission of Texas that Rowan and Nichols Oil Company shall be allowed to produce from its said Todd "B" Lease, in the W. H. Castleberry Survey, Gregg County, Texas, that proportion of the total allowable for the East Texas Field which is fixed by said decree of the District Court of the United States for the Western District of Texas, as hereinbefore set forth, until such time as said decree shall be set aside or modified by a court of competent jurisdiction, and tenders shall be issued for such oil so produced pending the reversal or modification of said decree.

RAILROAD COMMISSION  
OF TEXAS

Lon A. Smith, Chairman  
Jerry Sadler, Commissioner

(SEAL)

ATTEST:

C. F. Petet, Secretary

"EXHIBIT C"

RAILROAD COMMISSION OF TEXAS  
OIL AND GAS DIVISION

OIL AND GAS  
DOCKET NOS.

108, 120, 123, 124,  
125, 126, 128, 129,  
132 and 146  
No. 20-1508

IN RE: Conservation and  
prevention of waste of crude  
petroleum and natural gas  
in the state of Texas  
Austin, Texas  
April 25, 1940

**SPECIAL ORDER FIXING THE ALLOWABLE  
PRODUCTION OF CRUDE OIL IN THE  
VARIOUS FIELDS AND DISTRICTS  
IN TEXAS**

\* \* \*

RULE 23 of Division 3, as contained in an Order of the Commission dated October 17, 1933, pertaining to the EAST TEXAS FIELD as amended by an Order of the Commission dated September 11, 1939, is hereby readopted and amended as follows:

WHEREAS, The Commission finds that in order to prevent waste in said field that the allowable production during the month of May, 1940, should not average more than 400,000 barrels per day over the thirty (30) day period, and that no more than 690,000 barrels of crude oil should be produced from the East Texas Field in any one day during the month of May, 1940, and

WHEREAS, The Commission finds that there exists a market demand for crude oil, produced in such an amount in the East Texas Field during the month of April, 1940.

IT IS THEREFORE ORDERED That Rule 23, of Division 3 of the Commission's Order of October 17, 1933, pertaining to the East Texas Field be and it is hereby amended to read, effective May 1, 1940, as follows:

"RULE 23. (a) Not more than 690,000 barrels



of crude oil shall be produced from the East Texas Field during any day of the effective period of this Order.

(b) The total daily allowable for the field shall be distributed among the producing wells in the field on the following basis:

1. Each well capable of producing twenty (20) barrels of crude oil per day shall be allowed to produce twenty (20) barrels per day.

2. Each well incapable of producing twenty (20) barrels per day shall be allowed to produce that amount of oil which it is capable of producing in a 24-hour period, not in excess of twenty (20) barrels.

3. In addition to the twenty (20) barrels provided for in one (1) above, each well in the field which is capable of producing in excess of twenty (20) barrels daily shall be allowed to produce daily that proportion of the total daily allowable for the field remaining after deductions for one (1) and two (2) above have been made, that the product of such well's hourly potential by its bottom-hole pressure by the thickness of the saturated Woodbine Sand underlying the well by the average number of acres per well in the lease bears to the sum of such products for all of the wells in the field."

\* \* \*

IT IS FURTHER ORDERED That this Cause be

held open on the Docket for such further orders as may be necessary and supported by evidence of record.

**RAILROAD COMMISSION  
OF TEXAS**

Lon A. Smith, Chairman  
Ernest O. Thompson  
Jerry Sadler, Commissioners

(SEAL)

ATTEST:

C. F. Petet, Secretary

**"EXHIBIT D"**  
**RAILROAD COMMISSION OF TEXAS**  
**OIL AND GAS DIVISION**

**OIL AND GAS**  
**DOCKET NO. 120**  
**NO. 6-1507**

IN RE: Conservation and  
prevention of waste of crude  
petroleum and natural gas  
in the East Texas Field  
Austin, Texas  
April 25, 1940

**SPECIAL ORDER SHUTTING DOWN THE**  
**EAST TEXAS FIELD COVERING RUSK,**  
**SMITH, GREGG, CHEROKEE AND**  
**UPSHER COUNTIES, TEXAS**

WHEREAS, After due notice hearings have been held in Austin, Texas, at various times including a hearing on April 18, 1940, with respect to the existence and imminence of waste of oil and gas in the state of Texas and the prevention thereof, and

WHEREAS, On April 25, 1940, the Commission issued a "Special Order Fixing the Allowable Production of Crude Oil in the Various Fields and Districts in Texas," and

WHEREAS, Under said Order of the Commission the maximum quantity of oil which is permitted to be produced from the East Texas Field was set at 690,000 barrels per day, and

WHEREAS, The Commission finds that in order to maintain the bottom-hole pressure in the East Texas Field and in order to prevent waste, it is necessary that all wells in the East Texas Field be closed in for a total of fourteen (14) days during the month of May, 1940:

THEREFORE IT IS ORDERED That each and every well in the East Texas Field shall be shut in on the following days: May 1, 4, 5, 8, 11, 12, 15, 18, 19, 22, 25, 26, 29, and 31, 1940.

IT IS FURTHER ORDERED That no exceptions to this order will be granted except when justified by evidence presented to the Commission to the effect that, because of reservoir conditions, continuous production should be maintained to prevent physical waste, in which case, the total allowable of the well or wells so excepted shall be reduced during the period covered by this order an amount equivalent to fourteen (14) days' allowable during the month of May, 1940.

IT IS FURTHER ORDERED That the natural gasoline extraction plants be and are hereby given authority to advise the operators of the oil wells connected to their gathering systems that it will be agreeable for those operators of oil wells to produce their allowable oil on each of the days covered by this shut-down order with the understanding, however, that operators of oil wells so producing restrict the production a total of fourteen (14) days during the month of May, 1940.

IT IS FURTHER ORDERED That this order shall not apply to those wells in the East Texas Field which the Commission has found to be marginal wells and shown to be such on the Commission's current proration schedule now in force and effect in the East Texas Field.

IT IS FURTHER ORDERED That this Cause be held open on the Docket for such other and further orders as may be necessary and supported by evidence of record.

RAILROAD COMMISSION  
OF TEXAS

Lon A. Smith, Chairman  
Ernest O. Thompson  
Jerry Sadler, Commissioners

(SEAL)

ATTEST:

C. F. Petet, Secretary

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Office - Supreme Court, U. S.

FILED

FEB 28 1940

CHARLES ELMORE CROPLEY  
CLERK

No. **681**

In The  
**Supreme Court of the United States**  
OCTOBER TERM, 1939

RAILROAD COMMISSION OF TEXAS ET AL,  
*Petitioners*

VS

ROWAN & NICHOLS OIL COMPANY,  
*Respondent*

ANSWER TO PETITION FOR WRIT OF CERTIORARI  
TO THE UNITED STATES CIRCUIT COURT OF  
APPEALS FOR THE FIFTH CIRCUIT

DAN MOODY,  
RICE M. TILLEY,  
*Attorneys for Rowan &  
Nichols Oil Company.*

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No. \_\_\_\_\_

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In The  
**Supreme Court of the United States**

OCTOBER TERM, 1939

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RAILROAD COMMISSION OF TEXAS ET AL,  
*Petitioners*

VS

ROWAN & NICHOLS OIL COMPANY,  
*Respondent*

---

ANSWER TO PETITION FOR WRIT OF CERTIORARI  
TO THE UNITED STATES CIRCUIT COURT OF  
APPEALS FOR THE FIFTH CIRCUIT

---

TO SAID HONORABLE COURT:

Since the questions and specification of errors presented by the Attorney General of Texas, the Railroad Commission of Texas and its members really involve only one issue, this answer will be directed to that issue.

**ISSUE PRESENTED**

The fundamental question is whether or not the Railroad Commission of Texas can, by prorating the daily East Texas field allowable among wells on prac-

tically a per well basis, restrict the daily production of oil from the lease of Rowan & Nichols Oil Company, with large oil reserves, favorable position on the structure, and wells of high potential production, to substantially the same amount of oil that other leases with small reserves, unfavorable position on the structure, and wells of very low potential are allowed to produce, and thus deprive Rowan & Nichols Oil Company of its property and bestow it upon others, when such system of proration is not necessary to conserve the natural resource, but in fact contributes to its waste.

### STATEMENT

Rowan & Nichols Oil Company, Plaintiff in the trial Court, will be referred to as Plaintiff; and the Railroad Commission of Texas and others, Defendants in the trial Court, will be referred to as Defendants.

The recitation of facts made in the petition for review on writ of certiorari is not adopted, except as indicated. The statements of fact now made are based upon the findings of the trial Court.

(1) The statement by Defendants as to the nature of the East Texas field is substantially correct. This field is a common reservoir, the fluids therein migrating rather freely, with possible exception of a few small areas of no consequence with respect to the issue here involved. Pressure is readily transmitted from one point to another, and always there is an adjustment of pressures in the seeking of equilibrium. The reservoir fluids move from high pressure areas to low pressure areas, and by virtue of the pressure and movement of the water, the oil moves eastward. The

pressure of the water moves the oil eastward, and the oil is followed by the water. Although Plaintiff has as much oil in place now as ever, the water is constantly approaching, and if it is not permitted to produce its oil currently with others, this oil will pass on up-structure to the east and be forever lost to Plaintiff.

(2) While there is some lack of uniformity in porosity and permeability of the sands in some parts of the field, it may be said on the whole the Woodbine sand is fairly uniform. (R., 961) If the underground conditions of porosity and permeability are not generally uniform, certainly the present potential map of the Commission from which well allowables are calculated, reflects no lack of uniformity in these conditions, but, on the contrary, necessarily assumes a high degree of uniformity over wide areas and distances between contour lines. (R., 962) The sands are not of uniform thickness. (R., 961)

(3) Position on structure, thickness of sands and distribution of allowable all enter into ultimate recovery from any lease or area. Plaintiff's lease is ideally situated on the structure, and, under open flow conditions, would have a distinct advantage over leases both to the east and the west. (R., 977) Plaintiff's lease is in the portion of the field where the thick sand is found. (R., 976) This natural advantage can be changed, either increased or decreased, by the method of distribution of production. By the present method, avoidable drainage is not reduced to a reasonable minimum, but, on the contrary, it is aggravated to the material damage of Plaintiff. (R., 965) The migration of oil is not limited to from west to east alone, because where the drilling is dense in many

areas, these regions of concentrated withdrawals cause low pressure areas, which in turn cause the migration of oil to such areas. Although the statement in Defendants' application indicates otherwise, their own witness testified and the trial Court found that there are many areas to the west, and in fact in all directions, from Plaintiff's tract which are more densely drilled and where pressures are lower. (R., 965)

(3) The Commission, by granting exceptions to the spacing rule, departed from the idea of uniform and equitable withdrawals permitted by equal spacing where coupled with a proration order embracing appropriate factors such as true potentials, and granted numerous exceptions to the spacing rule, resulting in irregular spacing and unequal withdrawals throughout the field. (R., 966) Although one well will reasonably drain ten acres or more in said field of approximately 131,000 acres (R., 70), there are now some 26,000 wells in the field, or an average density of one well to 5.1 acres, all due to the constant exceptions granted by the Commission to the spacing rule, and in many instances, there are numerous wells on fractions of an acre. Plaintiff has a density of one well to approximately 5 acres, or a total of 5 wells on approximately 25 acres. (R., 68) Since all wells are given a minimum allowable of 20 barrels if they can make it, this permits a well to pay out in some two years, as pointed out by one of the Defendants' witnesses, and this encourages the drilling of more wells, and the operator who could get the most permits gets the most oil. (R., 540) As pointed out in the trial Court's opinion, therefore, the difficulty in which the Commission finds itself grows largely out of its relaxation of its own spacing rule, which is the equivalent of one well

to ten acres. The drilling of thousands of wells, unnecessary so far as the public interest is concerned, has required the Commission to listen to the demands of those well owners at the expense of other operators better situated. No effort has apparently been made to require those parties producing upon small and too densely drilled acreage to pool their tracts. (R., 73)

(4) The plan of distribution of allowable for the field has not for some years attempted to take into account the surface acreage in any lease or its underlying oil reserves. (R., 969) The R. M. Wood lease adjoining Plaintiff's lease has one well on one-tenth of an acre, or one acre as claimed by Defendants, and was permitted to produce substantially as much oil as any one of Plaintiff's wells drilled at a density of one well on five acres, although the underground and all other conditions were admitted to be the same, except it had to be assumed that as to each well on Plaintiff's lease, Plaintiff had fifty times as much oil as the Wood lease, assuming that lease to embrace only one-tenth of an acre. There were numerous instances all over the entire field of many wells drilled on tracts of less than one and two acres. (R., 969, 974, 976) Under the plan, Plaintiff's wells, with a daily potential of 20,000 barrels, were given only two barrels more daily, five days a week, than practically the poorest well in the field that would only produce 20 barrels a day. (R., 68, 69)

(5) A stipulation was entered into by the parties showing the effect of the plan of proration as interpreted and applied by the Commission. The substance of it was that each well in the field was given 2.2% of its hourly potential, and if the product did not amount to 20 barrels, the well was arbitrarily given



20 barrels. By this method of giving each well that would daily produce 20 barrels of oil, a minimum of 20 barrels, all of the daily allowable of 522,000 barrels was taken up but approximately 7,000 barrels, which in the practical application of the order of the Commission was the only oil allocated on the potential basis. The field allowable was therefore allocated  $98\frac{1}{2}\%$  on the per well basis. Plaintiff's share per well of this 7,000 barrels of allocable oil was approximately two barrels per day. (R., 69, 970)

(6) In August, 1937, after the Wood permit was granted and an appeal from the order granting the permit had availed Plaintiff nothing, application for an adjustment in allowable of said well to reduce it and to increase the allowable for Plaintiff's wells was sought before the Commission, and alternatively, in the event under the law it was necessary to drill additional wells, Plaintiff asked for some twenty permits to place it on an equal footing with Wood. The application for adjustment in allowable was denied, and permit for only one well was granted. (R., 978) Plaintiff already had more than sufficient wells to reasonably drain and produce the oil underneath its tract. (R., 70)

(7) The practical effect of the order is to allow Plaintiff to produce from its lease at a rate of approximately 4.5 barrels per acre per day, while Wood, on an adjoining tract, assuming it to be one-tenth of an acre, is permitted to produce 220 barrels of oil per acre per day, or if one acre, then 22 barrels per acre per day. (R., 983) Others are producing as high as 200 barrels per acre per day. (R., 975) Under the present plan of proration, on a five-day basis, it would take Plaintiff thirty-nine years to recover its oil, whereas

the rest of the field would have recovered all of the recoverable oil under it within eleven years. Others were recovering their entire reserves in one year. (R., 977) The Commission sought to justify its position under its interpretation of the marginal well law. It claimed that every well which would only pump 20 barrels or less per day must be given 20 barrels or what it would make, and thus this necessarily had to form a standard for the allocation upward to the other wells of the balance of the allowable. There were only 451 such marginal wells producing about 5500 barrels of oil per day. The trial and appellate Courts found and concluded that wells in the field could be pumped profitably at 5 barrels a day and a flowing well could be produced at that rate with more profit. (R., 989) The interpretation of the marginal well law by the Commission was frowned upon by the trial Court, since wells could be pumped profitably at substantially less than 20 barrels without causing ultimate loss of oil, injury to the well, or premature abandonment, and the Court observed that if Defendants' interpretation was correct, the scheme or the statute must fall. (R., 74, 75) From the standpoint of waste, it was found that none would occur if many of the wells in the field were actually shut in or were allowed to produce as little as 5 barrels a day. (R., 989) Any method of distribution of the field allowable which gives operators opportunity to receive their fair share of the allowable would not create as much waste as does the method of distribution under attack. (R., 991)

#### **REASONS FOR WHICH THE WRIT SHOULD BE DENIED**

Article 6049c, Vernon's Texas Civil Statutes (Chap. 76, Acts of the Forty-fourth Legislature, Regular Session), in conferring upon the Railroad Com-

mission the authority to restrict production to prevent waste, provides that:

"In the event any such rule, regulation, or order which the Commission may adopt provides for the limitation or fixing of the production of crude petroleum oil, or of natural gas from wells producing gas only, in any pool or portion thereof, the Commission shall distribute, prorate, or otherwise apportion or *allocate the allowable production among the various producers on a reasonable basis.*"

(*Italics ours*)

In Texas and in other jurisdictions following the absolute ownership view, the landowner is regarded as having title in severalty to the oil and gas in place beneath his land. (*Brown vs Humble Oil & Refining Co.*, 126 Tex. 296, 305; 83 S. W. (2d) 935, 940; 87 S. W. (2d) 1069)

In many decisions, largely involving the well spacing regulations of the Railroad Commission, the Texas Courts have frequently announced the rule that each landowner should be afforded the opportunity to produce his fair share of the recoverable oil. (*Empire Gas & Fuel Co. vs Railroad Commission*, 94 S. W. (2d) 1240, 1242 (error refused)). This holding recognizes the existence of correlative rights between the various landowners.

Obviously, no order of distribution would be "reasonable" or would comply with constitutional guarantees which did not respect within reasonable limits the property rights of the operators affected by the order. An order which in effect arbitrarily takes from one operator and gives to another plainly does not provide for a distribution on a "reasonable" basis. Moreover,

it results in unwarranted confiscation. The above quoted statute denies to the Railroad Commission power to allocate the allowable production among operators on any basis except a reasonable basis, and the Constitution of the United States prohibits any attempt by either the Legislature or the Railroad Commission to allocate production among operators on any other basis.

The Commission, by the order here involved, places the East Texas field on a per well basis,—a basis of proration respectfully repudiated by the Federal Courts. The evil existing in orders previously stricken exists here. It is subject to the same criticism directed by the Court at the order involved in *Peoples Petroleum Producers, Inc., vs Smith et al*, 1 Fed. Sup. 361, 365, wherein the Court said:

“Further, if we disregard the statutory prohibition against restricting supply to equal existing market demand, we think it equally plain that plaintiffs are entitled to relief. \* \* \* The rules have been entered and are being enforced in such fashion as to subject plaintiff's property to a confiscatory control. This control, transcending public necessity, has exerted the power granted beyond the necessities of the case. It has arbitrarily and without adequate grounds limited the total production of the field far below any amount which the evidence fairly shows the interest of the owners, consistent with public necessity, permits. In direct contravention of the statute, instead of justly and equitably distributing the reduction ordered, it has, through its per well requirement, so arbitrarily, unjustly, and in a confiscatory way distributed it, as that it will inevitably take the

oil of plaintiffs, situated as they are most favorably on the structure, to give it to others not so favorably situated."

Defendants sought to justify the per well order by the plea that eventually Plaintiff would recover its fair share of the oil, although it was not doing so at this time and had already lost several hundred thousand barrels of oil. The evidence did not support the contention. The contention was basically unsound, because Plaintiff is entitled to produce ratably with others at the present time, and it cannot be required to wait many years hence to share in the production that others not so favorably situated are sharing in now. As said by the Supreme Court of Texas in *Spann vs City of Dallas*, 111 Tex. 350, 355; 235 S. W. 513, 514:

"Property in a thing consists not merely in its ownership and possession, but in the unrestricted right of use, enjoyment, and disposal. Anything which destroys any of these elements of property to that extent destroys the property itself."

As appropriately said by the trial Court:

\* \* \* "The matter of present day confiscation is certain. Respondents are not entitled to require complainant to gamble as to what will happen to its oil or its markets over a period of twenty-five or thirty years.

"Furthermore, the Court is not of the opinion that the evidence bears the respondents out in the contention that the present order is the only one possible." (R., 72)



None of the elements of estoppel are present in this case. The uncontradicted testimony and the findings of the Court conclusively show that Plaintiff has ever been alert and has constantly protested to the Commission with regard to enforcement of the order without result. (R., 75) The present order is not the same order as was first applied and enforced as to Plaintiff, and during the period of years since its first application, the daily allowable has decreased and the number of wells granted to other operators in the field has increased from less than 10,000 to approximately 26,000, thus taking such an unreasonable and unfair part of the daily allowable that there was practically none left to allocate to Plaintiff and others similarly situated with wells and property of very high potential. (R., 75) (*Abie State Bank vs Bryan*, 282 U. S. 765, 776)

The testimony showed that there were other orders which the Commission could have adopted; curtailing, rather than creating, waste, and at the same time, equitably allocating the allowable not alone on the basis of reserves, but taking into consideration reserves, position on the structure, and other relevant factors. (R., 981, 974) (*Railroad Commission vs Rowan and Nichols Oil Company*, 107 Fed. (2d) 70, 73)

The trial Court did not attempt to write a proration order, but, on the contrary, admitted its lack of such authority. It observed, however, that since Plaintiff was clearly entitled to an injunction against the order, and since Plaintiff had not asked to produce its wells without restriction, that the Court would attempt to limit the injunction so as to do equity to Plaintiff, but, at the same time, not do injustice to adjoining



lease owners, and the injunction was therefore limited so as to permit Plaintiff to produce only that proportion of the daily allowable that its reserves bore to the reserves of the entire field, without prejudice, however, to the Railroad Commission "to enter a reasonable proration order and to fairly enforce it." (*Railroad Commission vs Rowan & Nichols Oil Company*, 107 Fed. (2d) 70, 73; *Newton vs Consolidated Gas Company*, 258 U. S. 165, 177) Certainly the Railroad Commission cannot complain of this action on the part of the Court because it redounds to its interest and benefit. (*City of Toledo vs Toledo Ry. & Light Co.*, 259 Fed. 450, 458; *Public Service Ry. Co. vs Board of Public Utility Commissioners*, 276 Fed. 979, 990; *Ottinger vs Consolidated Gas Co.*, 272 U. S. 576)

The burden of proof was discharged by Plaintiff when the undisputed testimony showed that the allocation of the allowable on a practically per well basis did not prevent waste, but, on the contrary, was conducive to waste, and that the effect and practical operation of the order was to take the property of Plaintiff and give it to others less favorably situated. The evidence further showed, as pointed out by the Circuit Court of Appeals, that the field would be depleted many years before Plaintiff would be given an opportunity to recover its oil. (R., 977) (*Railroad Commission vs Rowan & Nichols Oil Company*, 107 Fed. (2d) 70, 72)

By the pooling of tracts and eliminating unnecessary wells, further discrimination in the order could be eliminated. This the Commission claims it cannot do because a statute prohibits the unitizing of an entire field. However, Defendants' contention in this respect is impeached by the Commission's own orders, which have heretofore authorized such pooling, and

pooling has been suggested and upheld, respectively, by the Circuit Court of Appeals in *Magnolia Petroleum Company vs Blankenship*, 85 Fed. (2d) 553, and by a three-judge Court in *Tysco vs Railroad Commission*, 12 Fed. Supp. 195. (See Walker (University of Texas Law Professor), The Problem of the Small Tract Under Spacing Regulations, Bar Association, Texas Law Review, October, 1938, p. 157; Oil and Gas Journal, August 11, 1938)

Plaintiff would respectfully show, therefore, that there are no special or important reasons for granting a review on writ of certiorari in this case for the reasons hereinbefore stated and for the further reasons that:

(1) The decision of the Circuit Court of Appeals in this case is not only not in conflict with a decision of another Circuit Court of Appeals, but is in complete harmony with *Magnolia Petroleum Company vs Blankenship et al*, 85 Fed. (2d) 553, and all other cases on the subject.

(2) The decision in this case is not on an important question of local law probably in conflict with applicable local decisions, but is in complete harmony with and follows the settled law of Texas as announced in *Brown vs Humble Oil & Refining Company*, 126 Tex. 296, 83 S. W. (2d) 935, 87 S. W. (2d) 1069.

(3) The issue in this case has been settled by this Court in *Champlin Refining Company vs Corporation Commission* (Okla.) 286 U. S. 210; *Ohio Refining Company vs Indiana*, 177 U. S. 190, 202.

(4) The Circuit Court of Appeals has not decided the question in a way probably in conflict with applicable decisions of this Court.

(5) The Circuit Court has not departed from the accepted and usual course of judicial proceedings, nor has it sanctioned such a departure by a lower Court. (*Ottinger vs Consolidated Gas Company*, 272 U. S. 576)

Wherefore, Plaintiff prays that said petition for review on writ of certiorari be in all things denied.

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APR 15

CHARLES ELMORE CROPLEY  
CLERK

IN THE  
**Supreme Court of the United States**

OCTOBER TERM, 1939

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No. 681

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RAILROAD COMMISSION OF TEXAS ET AL,  
*Petitioners*

VS

ROWAN & NICHOLS OIL COMPANY,  
*Respondent*

---

**BRIEF FOR RESPONDENT**

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ON WRIT OF CERTIORARI TO THE UNITED STATES  
CIRCUIT COURT OF APPEALS FOR  
THE FIFTH CIRCUIT

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IN THE  
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OCTOBER TERM, 1939

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No. 681

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RAILROAD COMMISSION OF TEXAS ET AL,  
*Petitioners*

VS

ROWAN & NICHOLS OIL COMPANY,  
*Respondent*

---

**BRIEF FOR RESPONDENT**

---

**STATEMENT IN RESPECT TO JURISDICTION**

After Petitioners perfected their appeal to the Circuit Court of Appeals, the Railroad Commission promulgated, and is now enforcing, orders to control production of oil from the East Texas Field which are substantially different from the order and plan of proration involved in this suit. The difference in the orders and methods of proration appears to be material in that the daily field allowable has been increased from approximately 522,000 barrels to approximately 690,000 barrels, and in that the daily field allowable is prorated among wells on a different formula from the basis of proration under attack in this suit. Petition-

✓

ers construe the decree in this suit as affirmed by the Circuit Court of Appeals to prevent their enforcing such new order to control production from Respondent's Todd "B" lease and are allowing Respondent to produce under the decree. These facts do not appear in the record, but it is not believed that they will be controverted by Petitioners, and in the belief that it is proper to state them, they are stated because of their bearing upon, if they do bear upon, questions of jurisdiction.

#### STATEMENT OF CASE

Petitioners' statement of the case does not, in Respondent's view, sufficiently state the case and does not in all particulars conform to Respondent's understanding of the record.

Respondent alleged that its Todd "B" lease, covering 25 acres, is favorably situated on the structure, has large reserves, high pressures and high potentials; that the Railroad Commission's method of prorating the daily field allowable among wells in the East Texas Field was substantially a per well distribution of the field allowable, and allowed to densely drilled tracts and tracts with small reserves a disproportionate part of the field allowable and gave them an unjustified advantage over better and less densely drilled leases, like Respondent's lease, having approximately 95 feet of sand and drilled to a density of only one well to about five acres; that under this method of proration Respondent's lease was being drained and was not being allowed currently, and would not be allowed ultimately, to produce its fair share, or proportionate share, of the reserves of the field; that this method of proration was not necessary to prevent waste or otherwise protect

the public interest; that the regulation had the effect to deprive Respondent of its property and to deny to it the equal protection of the laws, in violation of the Fourteenth Amendment to the Constitution of the United States. Respondent prayed that this method of distributing the field allowable be adjudged invalid and that Petitioners be enjoined from further enforcing such method of regulation to prevent Respondent producing its fair share of the oil. (R., 1-16, 43-47)

The findings of fact were based on testimony which is practically undisputed on material points. Although Petitioners did not except to the findings of fact or request that they be modified or that additional findings be made, and, as Respondent understands, do not here question the sufficiency of the evidence to support the findings, they argue the suit from the testimony and not from the findings. Respondent will state the controlling findings of fact because in Petitioners' statement of the case and throughout the brief there are numerous statements purportedly based on the testimony of witnesses, but in conflict with the findings of the trial Court. For example, the statement that the portion of the field in the vicinity of Respondent's lease will produce longer than any other part of the field and be drowned out last, the inference being that Respondent's lease will be among the last to go to water, is in direct conflict with express finding of the trial Court (R., 985, supported by testimony, R., 622-624, 583) that water will drown out Respondent's wells before it drowns out wells to the east and up-structure from Respondent's lease. Again, the statement at one point that there is now as much oil beneath the surface of Respondent's lease as when the field was discovered and at another point that there is

substantially the same amount of oil beneath Respondent's lease as originally, is calculated to confuse because the statement ignores the difference between oil in place and recoverable oil in place, and also ignores the finding of the trial Court (R., 976-977, supported by evidence, R., 311-312) that there is less recoverable oil now under Respondent's lease than originally, and the finding of the trial Court (R., 987, supported by evidence, R., 603-608) that under the present plan of proration Respondent will not be permitted ultimately to recover an amount of oil equivalent to its original recoverable reserves.

In the following statement of the controlling findings, references to the findings of fact are in bold face type.

The East Texas Field is a common reservoir; the producing sand is 3,600 feet below the surface; a cross-section of the field resembles a triangle, the long or top side of which is in the plane formed by the bottom of the Austin Chalk, an impervious formation, the lower or west side of which is a line in the plane of oil-water contact, the eastern side of which is a line in the plane formed by the top of the Georgetown lime, an impervious formation; water is under the western part of the producing area; the pressure of the water is the principal source of reservoir energy; the center of the field, running from north to south, is the area of maximum sand thickness, where the sand is approximately 100 feet thick; from the center of the field to the east, and also to the west, the producing sand becomes thinner, until it pinches out at the edges of the field; with the exception of a few areas of no consequence with respect to the issues here involved, fluids move freely

through the sand from areas of high pressure to areas of low pressure; while some portions of the producing horizon are more porous and more permeable than others, on the whole the Woodbine sand is fairly uniform as to porosity and saturation of oil; as the field is produced water takes the place of the oil, and forces the remaining oil in the field up-structure to the east; the pressure gradient is high on the west, low on the east, and while the reservoir fluids on the whole tend to move up-structure to the east, there is also migration of oil to areas where, from dense drilling, the withdrawals have been greater than in other areas; while the spacing rule of the Commission (Rule 37) contemplates a uniform drilling pattern of one well to 10 acres, the rule provides for exceptions, and at the time of the trial most of the approximately 26,000 wells in the field had been drilled as exceptions to a general spacing rule. At the time of the trial the average density of drilling in the field was one well to 5.133-acres, but many areas throughout the field had been drilled to a substantially greater density than the average of the field—for example, in numerous places the well density was substantially greater than one well to one surface acre; on the whole, a very large area around Respondent's lease was drilled more densely than Respondent's lease. Except in a few isolated areas, one well will effectively drain 10 acres in the East Texas Field. (R., 959-965, 973, 974, 976)

Facts are now, and for some years have been, available from which it is possible to determine with reasonable accuracy the character and thickness of the sands in the field, the type of well which will be obtained in any given area, and the recoverable oil in



the field as a whole. (R., 962) \* \* \* "a wealth of information is already before the Commission from which it can determine the productivity, or at least the relative productivity, of the various leases in the field, in terms of relative recoverable oil under practical operating conditions." (R., 963) Position on the structure, sand thickness and distribution of allowables all enter into ultimate recovery from any lease. The natural advantage of a lease can be either increased or decreased by the method of distributing the field allowable. (R., 965)

While the Railroad Commission order fixed the daily field allowable at about 522,500 barrels of oil, and provided that each well shall be allowed to produce daily "a maximum of 2.32% of its hourly potential capacity as determined by the Commission," in the application and enforcement of this order (a) each well that could not produce as much as 20 barrels of oil per day was allowed to produce to the maximum of its capacity, (b) where 2.32% of the hourly potential of any well amounted to less than 20 barrels per day, the well was allowed to produce 20 barrels of oil per day, (c) where 2.32% of the hourly potential of any well amounted to more than 20 barrels of oil per day, such well was allowed to produce 2.32% of its hourly potential. This application of the order resulted in approximately 451 wells, not any one of which was capable of producing as much as 20 barrels per day, producing daily a total of approximately 5,250 barrels; in approximately 19,032 wells, with potentials ranging from 20 barrels of oil per day to 860 barrels per hour, each producing 20 barrels per day, or a total of approximately 380,640 barrels per day; in approxi-

mately 6,325 wells, having hourly potentials ranging from 865 barrels to about 1100 barrels, each producing 2.32% of its hourly potential, or a total of 136,610 barrels. The practical effect of the application of the order was to allow wells that could not produce as much as 20 barrels per day to produce to the maximum of their capacity, and to allow every other well in the field a minimum daily production of 20 barrels, leaving only approximately 7,000 barrels (less than 2%) of the daily field allowable to be prorated on a potential basis among approximately 6,325 wells having hourly potentials in excess of 865 barrels. (Averaged by the 6,325 wells, the 7,000 barrels of proratable oil equaled only slightly in excess of one barrel per well.) The spread between the daily allowable production of wells capable of producing only 20 barrels per day and those capable of producing 20,000 barrels per day was less than 6 barrels. (R., 969-972, 982-983)

The potential method of distributing the daily field allowable among wells was initiated in 1933, when the daily field allowable of approximately 750,000 barrels was prorated among less than 10,000 wells more uniformly spaced than the present drilling pattern of the field. Since that time the number of wells in the field has increased to nearly 26,000, and the daily field allowable has been reduced to about 522,000 barrels, with the result that the spread between the good wells and properties and the poorer wells and properties has become less and less, until under the plan of proration in question the field allowable is distributed almost 99% on a per well basis. Respondent's situation has completely changed since the potential method of distribution was adopted. Effect of the potential factor in the order is now practically nil. (R., 972-973, 991)

Respondent's 25-acre lease is situated near the center of the field in the "fairway," where the oil saturated sand is thick and the porosity and permeability of the sand is as high as in any part of the field; the sand under Respondent's lease averages 95 feet in thickness as compared with the average of 42 feet for the field; the hourly potential of each of Respondent's wells is placed at 964 barrels as compared with the field average of 605 barrels; Respondent's lease and wells are among the best in the field; five flowing wells have been drilled and are producing on Respondent's lease. The recoverable reserves originally under Respondent's lease were estimated at 60,000 barrels per acre, and at the time of the trial the recoverable reserves under its lease were estimated at about 46,000 barrels per acre. The daily allowable for Respondent's five wells was 111.83 barrels, or 4.4 barrels of oil per day per surface acre of the lease, or an average of 22.36 barrels per well per day, or only slightly in excess of two barrels more per day to each of Respondent's wells having hourly a potential of 964 barrels than was allowed to wells that could produce only 20 barrels per day. Other tracts more densely drilled, but not more favorably situated from the standpoint of reserves or position on the structure, were allowed to produce at rates as high as 200 barrels per surface acre per day; based on the minimum allowable of 20 barrels per day and the density of drilling on tracts, some areas were allowed to produce more oil per surface acre in one year than the combined production of Respondent's lease for a period of eight years. Many areas allowed the advantage of greater production are in portions of the field where the oil sand is thin and the reserves per acre are

much less than under Respondent's lease. In all directions from Respondent's lease there were more densely drilled areas where pressures are lower, and such conditions, in view of the drilling pattern and method of distribution, result in drainage of Respondent's lease and materially reduce Respondent's ultimate recovery. Adjoining Respondent's lease, R. M. Wood has drilled a well on an area, claimed by Respondent to be  $1/10$  of an acre, but by Petitioners to be 1 acre; this well is allowed to produce substantially as much as any of Respondent's wells. (R., 965, 974-978)

There are 2,374 acre feet of sand beneath Respondent's lease, or .04219% of the 5,586,000 acre feet of sand in the field; the daily allowable of Respondent's lease is only .02143% of the daily field allowable; to January 1, 1939, Respondent had produced from its lease 355,254 barrels of oil, or .027228% of the total of 1,340,730,000 barrels of oil produced from the field. While 37% of the estimated reserves of the field had been produced to January 1, 1939, Respondent had been allowed to produce only 23% of the reserves of its lease. These percentages are calculated from figures appearing in the findings at pages 976, 977 and 982. Respondent has produced 200,000 barrels less of oil than it would have produced if Respondent had been allowed to produce in the proportion that the reserves under its lease bear to the reserves in the field. The five wells on Respondent's lease are sufficient in number to recover the reserves of the lease under reasonable methods of proration. Respondent has for some seven years unsuccessfully appealed to the Railroad Commission for an adjustment of allowables,

and for relief from the damage resulting to it from the present plan of proration. (R., 976, 977, 978, 982, 991, 992.)

Oil reserves in the field and under the various leases can be calculated with reasonable accuracy. (R., 979, 980.)

The method of proration involved does not take into account the respective reserves under the various tracts or allow each producer to produce substantially in proportion to the recoverable oil under his tract, nor is there anything in the order or its application that takes into consideration the relative rights of operators to produce their fair shares of the oil; owners of leases are not given an equal opportunity to realize upon the known recoverable oil reserves of their respective leases; the method of proration involved denies to Respondent an opportunity to produce its fair share of the oil; and gives to others an opportunity to produce more than their fair share of the oil, and to drain oil from Respondent's lease. The allowables granted to poorer properties and small and densely drilled tracts, with the resulting greater recoveries allowed to these properties, result in drainage of the better and less densely drilled properties, including Respondent's lease, as well as a denial to Respondent of a fair share of the daily allowable. The only phase of the order that relates to the prevention of waste is the top daily field allowable; the present plan of proration causes unnecessary waste; the effect of the order is to take the oil of one operator and to give it to another. Respondent's lease is west of a line drawn through the approximate center of the field to the west of which line operators, under the method of proration in ques-



tion, will recover less than the amount of the reserves originally under their leases, while operators to the east of the line will, under such method of proration, recover more than the reserves originally under their leases. Under the present plan of proration Respondent is currently suffering loss and will not be permitted to recover ultimately a total amount of oil equivalent to the recoverable reserves under its lease, much less an additional amount which would be recoverable by virtue of the structural position of Respondent's lease; it is clear that under the present plan or one similar to it, time will not give Respondent an opportunity to recover its fair share of the recoverable oil in the field; even under the most favorable assumptions, an unreasonable time will have elapsed before there will even be a probable opportunity for Respondent to recover even a substantial part of its fair share of the reserves of the field. (R., 975-976, 980-987)

The per well method of distribution does not reduce avoidable drainage to a reasonable minimum. Reasonably avoidable drainage is aggravated by this method, to the material damage of Respondent. (R., 965) Methods of distribution have been suggested which, if adopted, would minimize the inequities and reasonably avoidable drainage resulting from the method of distribution in question. Numerous such plans are well known to the Commission and its engineers; they are workable and easy of administration. Many factors may properly be considered other than real potentials, or in connection with real potentials—such as sand thickness, surface area, recoverable reserves, pressures and location on the structure. Methods can be adopted which will be fair to all, and will give to Respondent an opportunity to produce its fair



share of the oil without being required to drill additional unnecessary wells to obtain such share. (R., 987-988). Any method of distributing the field allowable which gives to Respondent and others the opportunity to produce their fair shares of the allowable would not create as much waste as the method of distribution in question; and, on the contrary, some of the methods suggested would have a tendency to reduce waste. (R., 988-992)

From the standpoint of waste, none would occur if many wells in the field were shut in, plugged or allowed to produce as little as 5 barrels per day, although it might be advisable to produce every other day, or one day in three or four days, the average allowable of these wells rather than allowing them to produce their allowable each day. (R., 989) The finding is supported by testimony that many wells could be shut in without resulting in waste (R., 628, 634-635), and the wells could be produced at an average rate of 5 barrels per day (R., 276, 637). In contending that Respondent has conceded that a well minimum is necessary, Petitioners are incorrect,—evidently having given undue value to isolated language instead of considering the whole testimony, or having misconstrued the meaning of testimony that, if a minimum can lawfully be fixed, a 20 barrel minimum is not necessary to prevent waste or to make operations profitable, but that wells can be profitably operated without waste on a 5 barrel minimum per producing day, if the wells are properly operated.

In only two instances does 'Petitioners' brief refer to the findings of fact. These are at page 4 of the brief, in quoting the stipulation concerning the method of proration, and at page 42, in referring to

the trial Court's finding and conclusion that wells in the East Texas Field could be produced without waste at substantially less than 20 barrels each per day. How far the excerpts of testimony relied upon by Petitioners are in accord with the testimony as a whole could only be developed by setting forth the testimony at length; but how far these excerpts were rejected by the findings will appear by comparing the excerpts with the above statements from the findings of fact.

Petitioners contend that the trial Court attempted to write a proration formula for the Railroad Commission, and Respondent answers that the provision of the decree whereby the Commission is enjoined from interfering with Respondent in daily producing that proportion of the daily field allowable that 220 bears to 522,000 is to be construed as limiting the amount of oil that Respondent may produce without interference by the Commission, pending appeal or the writing of a valid order. If there ever was any doubt concerning the proper construction of that part of the decree, the doubt has been removed by the order of the Circuit Court of Appeals that the decree is without prejudice to the right of the Commission to make and enforce a valid order.

### SUMMARY OF ARGUMENT

(1) The Texas rule of property is that the owner of land owns the oil and gas beneath it; that the owner of an oil and gas lease owns the oil and gas in place beneath the land affected by the lease.

(2) The Texas law is that under proration the owner of the oil and gas estate in land is entitled to "an equal opportunity with adjoining leaseholders of

developing and realizing for his leasehold"; or, otherwise stated, he is entitled to "a fair chance to recover the oil and gas in or under his land, or their equivalent in kind," that is, he is entitled to an opportunity "to recover a quantity of oil and gas substantially equivalent in amount to the recoverable oil and gas under his land."

(3) The reasonableness of the potential method of proration is unimportant in this case because the method of proration here involved was not a potential method, for approximately 99 per cent of the field allowable was divided among wells on a basis of 20 barrels per well. Such a per well basis of proration does not result in a distribution of the field allowable on a reasonable basis as is required by law, and is arbitrary and confiscatory, and has previously been condemned by the courts.

(4) The method of proration enforced to control production from Respondent's lease, not being necessary to prevent waste, and resulting in unnecessary and unreasonable drainage of Respondent's lease by other operators and in preventing Respondent's currently or ultimately recovering its fair share or proportionate share of the recoverable oil, was unreasonable and confiscatory, and the trial Court properly enjoined the enforcement of such method of controlling production from Respondent's lease, and the Circuit Court of Appeals properly affirmed that judgment.

(5) Respondent repeatedly protested being made to suffer from the injustice, inequities and unreasonableness of the method of proration here involved and timely brought this suit to protect its property from confiscation.

## ARGUMENT

### I.

**The rule of property in Texas with respect to ownership of crude petroleum oil and natural gas is that an owner of land owns the oil and gas in place thereunder, and that under the conventional form of oil and gas lease, such as is involved in this case, the lessee owns the oil and gas in place.**

Texas follows the absolute ownership view with respect to ownership of crude petroleum oil and natural gas, the rule of property in this State being that the land owner is regarded as having absolute title to the oil and gas beneath his land. (*Thompson vs Consolidated Gas Corp.*, 300 U. S. 55, 68; *Stephens County vs Mid-Kansas Oil & Gas Company*, 113 Tex. 160, 169, 254 S. W. 290, 294, 29 A. L. R. 566) It has been specifically held that this property right is not in any sense an undivided interest as of a cotenant or tenant in common in the entire reservoir. (*Magnolia Petroleum Company vs Zeppa* (Tex. Civ. App.), 70 S. W. (2d) 777, 779)

The lessee in a conventional form oil and gas lease, under the law of Texas, is regarded as owning the oil and gas beneath the land affected by the lease. (*Brown vs Humble Oil & Ref. Co.*, 126 Tex. 296, 305, 83 S. W. (2d) 935, 940; *Waggoner's Estate vs Sigler Oil Co.*, 118 Tex. 509, 517, 19 S. W. (2d) 27, 28)

Petitioners' brief concedes the law of Texas to be as here stated.

### II.

**The statutes of Texas empowering the Railroad Commission to make rules and regu-**

lations for the prevention of waste of oil and natural gas limit the exercise of the powers granted by providing that in the event any regulation is adopted limiting the production of oil or natural gas in any pool, the Commission shall prorate or apportion the allowable production of the pool among the various producers "on a reasonable basis"; and the Supreme Court of Texas has declared that under proration every owner or lessee of land in the field has a right to a fair chance to recover the oil and gas in or under his land or their equivalent in kind.

At common law, as declared by the courts of Texas, a land owner could drill an unlimited number of wells upon his land and produce all of the oil and gas that could be produced from his wells. This right was limited by the right of the adjoining land owner to drill on his land and by producing oil and gas diminish production of the offset owner. Texas conservation statutes give the Railroad Commission power to limit enjoyment of this common law right when reasonably necessary to prevent waste.

The conservation statutes define waste (appendix, p. 36) and give the Railroad Commission power to make and enforce rules for the prevention of waste. Among the powers so granted to the Railroad Commission is the power to make and enforce regulations controlling the drilling of wells and the production of oil (Appendix p. 38). These powers of the Railroad Commission are not absolute but are limited. Their exercise is limited by the principle applicable in any exercise of the police power, namely, that the power

may be exerted to restrict the use and enjoyment of private property only to the extent reasonably necessary to protect the public interest. Then, the statutes which grant regulatory powers to the Railroad Commission also limit the exercise of the power.

Chapter 76, section 6, Acts of the Regular Session of the Forty-fourth Legislature of Texas, 1935, (Article 6049c, section 7, Vernon's Civil Statutes of Texas) provides that:

\* \* \*

"In the event any such rule, regulation or order which the Commission may adopt provides for the limitation or fixing of the production of crude petroleum oil, or of natural gas from wells producing gas only, in any pool or portion thereof, the Commission shall distribute, prorate, or otherwise apportion or allocate, *the allowable production among the various producers on a reasonable basis.*"

\* \* \* 1

By imposing upon the Commission the duty to distribute or prorate the "allowable production among the various producers on a reasonable basis," the statute prohibits the Commission distributing the allowable production on any other basis. In so limiting the exercise of the powers granted, the statute recognizes the principle that under the due process and equal protection clauses of the Fourteenth Amendment to the Constitution of the United States, any arbitrary or unreasonable restrictions on production, or arbitrary or unreasonable method of allocating among owners the allowable production, would be void.



"Reasonable basis" as used in this connection means a basis that will protect the rights of the respective land and lease owners by not unnecessarily restricting their use of their property and by not taking unnecessarily the property of one person and giving it to another. (*Lilly vs Conservation Commission of La.* 29 Fed. Supp. 892, 893, 897.)

Any basis of restricting production or of distributing the field allowable among wells that is not reasonable or that otherwise results in an arbitrary or unreasonable taking of property is contrary to the statutes and is violative of the due process clause of the Fourteenth Amendment to the Constitution of the United States. Such regulation would be unreasonable and arbitrary within the meaning of the Fourteenth Amendment, because it would be an instance of an administrative agency attempting to exercise power not granted by law; and, independent of the statute, such a regulation, because of its arbitrary and unreasonable character, would be violative of the Fourteenth Amendment. Compare: *Ohio Oil Co. vs. Indiana*, 177 U. S. 190, 210; *Bandini Co. vs. Superior Court*, 284 U. S. 8, 18; and *Champlin Refg. Co. vs. Commission*, 286 U. S. 210, 233.

Not only do the statutes require that the allowable of a field be distributed on a reasonable basis, and so prohibit distribution on any other basis, but the Supreme Court of Texas and various intermediate appellate courts have construed the conservation statutes and declared property rights to require that proration regulations be administered in a manner that will allow land or lease owners a reasonable opportunity to realize upon their property. In *Bass vs Railroad Commission*,

(Civ. App.), 10 S. W. (2d) 586, 588, passing upon the right of a lease owner to drill wells under the Railroad Commission's well spacing rule, the Court held that the test of reasonableness in administration of the rule was whether or not an operator "would have an equal opportunity with adjoining leaseholders of developing and realizing for his leasehold."

In *Brown vs Humble*, 126 Tex. 296, 309, 312; 83 S. W. (2d) 935, 942, 944, involving the Railroad Commission's well spacing rule, the Court quoted with approval from *Ohio Oil Co. vs. Indiana*, 177 U. S. 190, 202, involving the owner's right to the unrestricted production of oil and gas from his land, in part, as follows:

\* \* \* Hence it is that the legislative power, from the peculiar nature of the right, and the objects upon which it is to be exerted, can be manifested for the purpose of protecting all the collective owners, by securing a just distribution, to arise from the enjoyment, by them, of their privilege to reduce to possession, and to reach the like end by preventing waste."

Continuing, the Supreme Court of Texas, speaking through Mr. Justice Sharp, said:

\* \* \* "The exercise of the police power under this rule (spacing rule) does not change the rule of property. It merely regulates and controls the way in which his property shall be used and enjoyed. Each person still owns the oil and gas in place under his land, and each still has the right to possession, use, enjoyment, and ownership of the oil and gas produced through wells located on his land, re-

ardless of its origin. The primary rule of ownership is still operative. The rule of convenience becomes secondary.

"Conditions may arise where it would be proper, right, and just to grant exceptions to the rule so as to permit wells to be drilled on smaller tracts than prescribed therein. Also, conditions may arise where it would be proper, right, and just to permit tracts to be subdivided and such subdivisions drilled after the adoption of the rule; but in all such instances it is the duty of the commission to adjust the allowable, based upon the potential production, so as to give to the owner of such smaller tract only *his just proportion* of the oil and gas. By this method each person will be entitled to recover a quantity of oil and gas substantially equivalent in amount to the recoverable oil and gas under his land." \* \* \*

"The commission, in order to prevent waste, has the power to limit the rate of flow in the same way that it has the power to regulate spacing. \* \* \* This right to control the rate of flow in order to prevent waste also enables the commission to offset the advantage obtained by one who is given an exception to the spacing rule by limiting his allowable production to the extent necessary to overcome this advantage. In this way the commission, by controlling the oil stored in the common reservoir, is enabled to carry out the dominant purpose of preventing waste, and at the same time, permit each owner to enjoy the opportunity fully to realize upon his estate by developing and recovering his oil and gas." \* \* \*

In the case of *Gulf Land Company vs Atlantic Refining Company* (Texas Supreme Court, not yet of-

ficially reported), 131 S. W. (2d) 73, 80, involving an order granting a permit to drill a well in exception to the well spacing rule, the Court, speaking through Mr. Justice Critz, said:

"It is the law that every owner or lessee of land is entitled to a fair chance to recover the oil and gas in or under his land, or their equivalents in kind."

The right of an owner or lessee of land to produce his fair share of the oil and gas and to a reasonable opportunity to recover the recoverable reserves under his land and to have allowables adjusted to attain this end was recognized in *Magnolia Petroleum Company vs. Blankenship*, 85 Fed. (2d) 553, 555 (Fifth Circuit) (writ refused, 299 U. S. 608). In that case, the Court, speaking through Judge Sibley, said:

"Blankenship having been refused a permit for a well on his small tract would have been unable to save any of his oil unless by some arrangement, voluntary or forced, he could share in the oil produced from nearby wells. But he now has a well and is at peace with the commission and the state. The question is, What are the private obligations between him and his neighbor Magnolia? Before the conservation statutes, each could have put on his own land all the wells desired without accountability to the other. The law through the commission has stopped that. But an owner unable to protect himself from drainage by an offset well is given the right to petition the commission and the commission has power and a consequent duty to 'prevent injury to adjoining property,' and touching a common pool or portion of it to 'distribute, prorate or other-

wise allocate the allowable production among the various producers.' This we think is the remedy which Magnolia should seek if it believes that Blankenship is getting more than his fair part of the oil. \* \* \* We are of opinion that Blankenship's well, whether lawfully put down or not, ought not to be permanently closed at the instance of Magnolia, and that Magnolia's preventive remedy if Blankenship is producing too much oil is to apply to the commission for a rule of proration among all the competing wells."

\* \* \*

\* \* \* "Magnolia Petroleum Company is given no authority to enforce the commission's rules and orders, but can only assert its own private rights. We hold that it has under the circumstances of this case, which include the commission's refusal to question Blankenship's right to operate his well, no equity to a permanent injunction, but that if its oil lands are being unduly drained by Blankenship's well and by the other two wells on the same two-acre tract which before subdivision in 1933 was a unit of less than twenty acres, the legal and sufficient remedy is to obtain a proration adjustment order from the commission.

\* \* \* We suppose that if the commission denies to any subdivision of such tract its own well that it can make some just apportionment of the oil produced on those subdivisions which are allowed wells; \* \* \* It is for the commission on a hearing for a proration order to say what production should be allowed to the whole two-acre tract as against Magnolia and other adjoiners, and within that tract what proportion if any of the production allowed to it should be awarded to Blankenship's well as against the other two wells previously on the tract."



The opinions in the *Brown vs Humble Oil & Refining Company* and *Magnolia Petroleum Company vs Blankenship* cases, *supra*, have been cited with approval in numerous other cases. See *Sun Oil Co. vs Gillespie*, (Tex. Civ. App.) 85 S. W. (2d) 652, 654, writ dismissed; *Atlantic Oil Producing Company vs Railroad Comm. of Texas*, (Tex. Civ. App.) 85 S. W. (2d) 655, 658; *Humble Oil & Refining Company vs Lasseter*, (Tex. Civ. App.) 95 S. W. (2d) 730, 732, writ dismissed; *Stanolind Oil & Gas Company vs Railroad Commission* (Tex. Civ. App.), 96 S. W. (2d) 664, 665, writ dismissed.

In *Peoples Petroleum Producers, Inc. vs Smith et al*, 1 Fed. Sup. 361, 365, the Court, speaking through Judge Hutcheson, said:

\* \* \* "in direct contravention of the statute, instead of justly and equitably distributing the reduction ordered, it has, through its per well requirement, so arbitrarily, unjustly, and in a confiscatory way distributed it, as that it will inevitably take the oil of plaintiffs, situated as they are most favorably on the structure, to give it to others not so favorably situated."

It is the settled law of Texas that under proration the allowable of a field must be equitably distributed among the leases and wells, preserving to each owner substantially that which he owns, and if a proration method "strips the best properties down to the level of the worst and takes from one owner to give to another," the attempted regulation is contrary to law.

The statutory law of Texas and the property rights of land and lease owners, as declared by the courts,



require an equitable and reasonable distribution of the field allowable among lease operators. Any method of proration adopted by the Commission which does not distribute the field allowable on a reasonable basis is void because the power to adopt and enforce such a method has not been, and in law could not be, granted to the Railroad Commission. The Fourteenth Amendment is a bar to any attempt to authorize a distribution of the allowable on any basis other than a reasonable basis, as it is also a bar to any attempt to distribute the allowable on any other basis.

### III.

**The proration order involved here does not prorate the field allowable on a reasonable basis, but, as applied and enforced, prorates the field allowable substantially on a per well basis, an arbitrary and unreasonable basis; and, as applied and enforced, to control production from Respondent's lease, it operates to confiscate Respondent's property.**

The words in which the Railroad Commission's proration order is cast are unimportant; the manner in which it is construed, applied and enforced by Petitioners is important. The findings of fact disclose how the order is applied and enforced, and the effect thereof upon Respondent's property. The statement of the nature of this case discloses the effect of the order as applied to Respondent.

The findings of fact establish that Respondent's lease, located in the best part of the field, has a sand thickness of approximately 95 feet; that the potential of each of Respondent's wells is 964 barrels per hour.

It is also established by the findings that while Respondent's lease comprises .0188 per cent of the surface area of the field, the acre-feet of oil sand under Respondent's lease equals .04219 per cent of the total acre-feet of sand in the field. The allowable for Respondent's 5 wells was only .02143 per cent of the daily field allowable; Respondent had been allowed to produce only .027228 per cent of the oil produced from the field up to January 1, 1939, notwithstanding the fact that .04219 per cent of the acre-feet of sand in the field was under Respondent's lease. (R., 982) It is also established by the findings that under the method of proration enforced to control production from Respondent's lease that each of Respondent's wells, with a potential of 964 barrels per hour, or over 20,000 barrels per day, is allowed to produce only slightly in excess of two barrels more per day than the daily allowable granted wells which can produce only 20 barrels per day, or less than 1 barrel per hour.

The well drilled on the Wood tract, adjoining Respondent's lease, is allowed to produce approximately the same amount of oil per day as any one of Respondent's wells, with the result that if the Wood lease comprises 1 acre, as contended by Petitioners, the Wood lease is allowed to produce five times as much per surface acre per day as Respondent's lease; and if the Wood lease comprises  $1/10$  of an acre, as testified by one of Respondent's witnesses, then the Wood lease is allowed to produce fifty times as much oil per surface acre per day as Respondent's lease. The findings of fact establish, and they are not challenged, that many areas in the field are drilled to a density greater than one well to less than 1 acre and that some of these tracts, allowing to their wells 20 barrels per day, are producing ap-

proximately fifty times as much per surface acre per day as Respondent's lease. (R., 975) The order in allowing these disproportionate recoveries does not distinguish between tracts with thin sand and small reserves and the tracts with thick sand and large reserves. (R., 969)

In distributing the field allowable no account is taken of density of drilling, sand thickness, reserves, acreage of leases, true potentials, bottom hole pressures, or any other factor by which can be measured the reserves of a lease or its capacity to produce. (R., 981) Only approximately 7,000 barrels of the daily field allowable of more than a half million barrels of oil is distributed other than on a per well basis. The 7,000 barrels over and above that part of the daily field allowable absorbed by the weak wells and by the 20-barrel minimum are divided out among approximately 6,325 wells, with the result that no well in the field (even wells like Respondent's, capable of producing as much as 20,000 barrels of oil per day) is allowed to produce as much as 6 barrels more of oil per day than the allowable of wells which can produce not exceeding 20 barrels per day. Approximately 99 per cent of the field allowable is distributed among wells on a flat per well basis without distinction as to density of drilling, reserves, position on the structure, true potentials, bottom hole pressures, or any other factor by which can be measured the value of a property or the capacity of a well or lease to produce. In the application and enforcement of the order, the best properties in the field are reduced to substantially the level of the poorest properties in the field. Under such a method of proration ownership of large acreage means nothing, ownership of many twenty barrel wells

means everything; ownership of thick sands and large reserves means nothing, a densely drilled tract means everything. This method of proration causes a densely drilled tract of poor reserves to pay greater daily production dividends than a less densely drilled tract of rich reserves. The practical effect of the order can be vividly demonstrated by comparing two 5-acre adjoining leases in any part of the field, one having one well, the other having five wells. The method in question permits the 5-well lease to produce 5 times as much oil per day as the 1-well lease, although one well is sufficient to produce the oil from five acres. The one produces five times as fast as the other. It cannot be disputed that such a method of proration operates to deny equal opportunities to operators, and to take one man's property and give it to another.

Respondent's objections to this method of proration are not answered by saying that Respondent may drill more wells and by producing them secure more oil. This is true, first, because Respondent has applied for permits to drill additional wells and was granted a permit to drill only 1 additional well (R.,978) which, under the order in question, would allow Respondent to produce only about 22 additional barrels of oil per day; second, because the 5 wells on Respondent's lease are sufficient to produce the recoverable oil thereunder, and to require Respondent to drill additional wells, when existing wells are sufficient under proper regulations to produce the recoverable oil under the the lease, would subject Respondent to a confiscation of its property to the extent of drilling, operating and other costs; and, third, if Respondent drilled more wells and others followed his example, the purpose of obtaining more oil would not be attained because the

division of 522,500 barrels field allowable, fixed to prevent waste, would be divided among more wells and the per well allowable would be reduced.

The trial court stated: "The proration of this field on a per well basis has been considered and condemned in a number of cases before this. See *Peoples Petroleum Producers, Inc. vs Smith et al*, 1 Fed. Sup. 361; *Peoples Petroleum Producers, Inc. vs Lon A. Smith et al*, Equity No. 386, Tyler Division, Eastern District of Texas, decided March 17, 1933, unreported; *Rowan & Nichols Oil Company vs Terrell et al*, Equity No. 479, Tyler Division, Eastern District of Texas, decided March 17, 1933, and unreported." (R., 69)

The Supreme Court of Oklahoma in *Patterson vs Stanolind Oil and Gas Co.*, 182 Okla. 185, 77 Pac. (2d) 83, 88, after having quoted from *Ohio Oil Company vs Indiana*, *supra*, and *Champlin Refining Co. vs Corporation Commission*, *supra*, held that, in prorating production from a field, the administrative agency, even in a state where the ownership in place rule does not prevail, must direct a "just distribution" among the various owners of mineral rights, and quoted with approval a part of Judge Kennamer's dissenting opinion in the Champlin case (51 Fed. (2d) 823, 834), as follows:

"Acreage is ignored and an operator with two 5,000 barrel wells on 5 acres may take out of the common source of supply, under the provisions of section 4, as much oil as an operator with two 5,000 barrel wells on 20 acres in the same field. *Proportionate taking per well* is wholly inequitable if the Legislature intends to secure 'a just distribution, to arise



from the enjoyment \* \* \* of their privilege to reduce to possession', because the operator with 20 acres has four times as much privilege as the operator with 5 acres in the same field.

Petitioners argue that proration on the basis of potential of wells is the best practical means of allocating the allowable according to productive capacity of wells. Respondent considers that the argument is beside the question because the findings in this case show that the field is not prorated on a potential basis, but substantially on a per well basis. But, if the merits of the potential method were involved, then Petitioners' argument is answered by unchallenged findings of the trial Court as follows:

\* \* \* "The most that can be said of a potential is that it reflects accurately only the mechanical efficiency of a well to produce at the time and under the conditions existing when the test was made. Relatively, it may indicate in some small way other factors. \* \* \* Two potential tests taken on wells on adjoining tracts, where the sand and other reservoir conditions are substantially the same, will show substantially the same potential only where like equipment is used, the same penetration is made into the sand, and the same back pressure maintained on the wells when the tests are made. Wells throughout the field are equipped and drilled differently." (R., 967-968)

Since wells in the East Texas Field are not drilled on uniform spacing it is obvious from the above quoted finding that potentials, even if accurately taken, would



not form a reasonable basis for distributing the field allowable. See also Record, pp. 968-969, 980, 981.

Petitioners contend that whatever may be the infirmities of the method of proration involved, Respondent failed to show a present injury or that under the present plan of proration it will not, during the life of the field, be allowed to recover its share of the oil. In support of this contention Petitioners argue that there is in place beneath Respondent's lease at this time substantially the same amount of oil as was in place originally and compare the average production per surface acre from Respondent's lease with production from the field.

In discussing the amount of oil beneath Respondent's lease, Petitioners speak in terms of barrels of oil under the land but carefully avoid mention of *recoverable oil*. The finding of the Court was that the recoverable reserves originally in place under the lease were estimated at 60,000 barrels per surface acre; that the reserves under Respondent's lease at the time of trial were estimated at 46,000 barrels per acre. (R., 976)

In stating that production from Respondent's lease up to the time of trial averaged 14,210 barrels per acre, as compared with 9,810 barrels per acre for the field, Petitioners speak in terms of surface acres and carefully avoid making the comparison on the basis of production per acre foot of sand. Surface acreage alone does not measure reserves beneath a lease. The number of feet of saturated oil sand multiplied by surface acreage gives the number of acre feet of sand beneath a lease; and permeability and porosity being substantially uniform, as is the case in the East Texas Field, acre feet of sand forms a fair basis of comparing leases for reserves. The average sand

thickness in the field is 42 feet; the average sand thickness under Respondent's lease is 95 feet. (R., 982) That is to say, averaging the field, every surface acre represents 42 acre feet of sand; while, as compared with the average, every surface acre of Respondent's lease represents 95 acre feet of sand. Respondent's accumulated production of 14,210 barrels per surface acre, expressed in production per acre foot of sand, is 149 barrels per acre foot; while the average for the field is 229 barrels per acre foot of sand. Respondent, therefore, has been allowed to produce per acre foot of sand only 65 per cent of the average of the field. This discrimination against Respondent could not be explained by charging Respondent with delay or neglect, nor do Petitioners attempt to do so or otherwise explain it, for the record shows that Respondent was diligent in developing its lease.

The arguments of Petitioners in support of their contention that Respondent failed to establish that it had been injured by the method of proration involved and had also failed to establish that the method would prevent Respondent's ultimately recovering its fair share of the oil are grounded upon excerpts quoted from the testimony. The findings of fact completely answer the contention and every argument advanced in support of it. The trial Court found that the method of proration in question resulted in drainage of Respondent's property (R., 965, 981); that Respondent was currently suffering loss of its oil by reason of the enforcement of the order (R., 982-987); that under the method of proration in question, or any similar method, Respondent would not ultimately recover the reserves under its lease or their equivalent (R., 980, 981, 987)

Petitioners assert that Respondent failed to establish that the minimum allowable of 20 barrels per well was not reasonably necessary to prevent waste and confiscation of property. The record does not justify the assertion.

The trial Court found that the 20 barrel minimum was not necessary to prevent waste. In support of this finding, the trial Court had not only the testimony of witnesses introduced by Respondent that it was not necessary to prevent waste, but also the testimony of Petitioners' witnesses that the wells could be operated on less than 20 barrels per day (see Hudnall's testimony, R., 522-524, 552; and Cottingham's testimony, R., 405-406, 410-411). The allowance of 20 barrels minimum to all wells in the densely drilled areas in the eastern part of the field, where the pressures are low, causes excessive withdrawals and resulting unnecessary loss in pressure and abandonment of wells, which is waste (R., 586-587, 963, 965, 973-978, 981, 991). The finding is further supported by undisputed testimony that over a period of years wells have been operated on less than 5 barrels per day. The total production of wells that could not produce as much as 20 barrels per day was approximately 5,250 barrels of oil,—or an average of slightly in excess of 11 barrels per well per day (R., 970). The Circuit Court of Appeals stated that there was undisputed evidence tending to show that a pumping well averaging 5 barrels production per day can be operated with some profit and that it followed that flowing wells producing the same quantity of oil could be operated at a larger profit (R., 1109).

The 20 barrel minimum, therefore, was shown not to be necessary to prevent waste. Moreover, the 20 barrel minimum absorbs so much of the daily field al-

lowable that the better wells and properties cannot, within the field allowable, be allowed their fair share of the production. The influence of the 20 barrel minimum causes the method of proration in question to reduce the best leases and wells in the field to the level of the poorest leases and wells, causing an arbitrary discrimination in the proration of the field allowable and confiscation of Respondent's property.

The trial Court's finding that several methods of distribution have been suggested which, if adopted, would minimize the inequities and the reasonably avoidable drainage resulting from the present method of distribution, and that numerous such plans are well known to the Commission and its engineers and are workable and easy of administration, shows that the Commission could, if it were willing, give relief from the inequities and injustices of the method of proration attacked in this suit. (R., 987, 988)

#### IV

**Respondent repeatedly, over a period of years, protested the inequities and injustices of the present order and timely brought this suit.**

The trial Court found, and the finding is supported by undisputed evidence, that Respondent had constantly protested to the Commission with regard to the order and had appeared in court protesting the same and had applied alternatively for permits to drill additional wells, however unnecessary they might have been to the production of its oil. The Court further found that Respondent's protests to the Commission did not result in the Commission's granting Respondent relief. (R., 991-992)

*Abie State Bank vs Bryan, Governor*, 282 U. S. 765, 776, answers Petitioners' contention that Respondent has accepted the benefits of the order and cannot now dispute its validity. *Thompson vs Consolidated Gas Corp.*, 300 U. S. 55, 80.

**The trial Court did not adopt a particular method of proration.**

Petitioner's argument that the judgment of the trial Court adopted a method of proration that would be discriminatory and confiscatory is based upon that provision of the trial Court's decree whereby the Commission is enjoined from interfering with Respondent in daily producing that proportion of the daily field allowable that 220 bears to 522,000. In the trial Court's opinion (R., 75) it was stated that Respondent had not prayed the Court "for a sweeping writ, allowing it to produce its wells without restriction." The proper construction of the pertinent provision of the decree is that by enjoining the Commission from interfering with Respondent in producing the stated amount of oil the Court was limiting the amount of oil Respondent could produce pending appeal or promulgation by the Commission of a valid proration order.

If there ever was any question about the proper construction of this provision of the decree that question has been set at rest by the following language in the opinion of the Circuit Court of Appeals:

In order to remove any doubt as to the temporary character of the ratio fixed by the District Court, the judgment will be amended to read 'without prejudice to the right of the Commission to enter a reasonable proration order and to fairly enforce it.' " (R., 110).

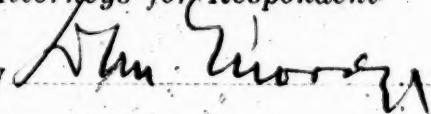
WHEREFORE, Respondent submits that the method of proration involved was not necessary to prevent waste, but tended to cause waste; and was arbitrary and unreasonable, and operated to confiscate Respondent's property, and that the judgment of the trial Court and Circuit Court of Appeals should be affirmed.

Respectfully submitted,

✓ DAN MOODY,  
RICE M. TILLEY,

*Attorneys for Respondent*

By





## APPENDIX

(All Statutes Listed Below are Included in Texas Revised Civil Statutes, 1925, or Amendments as Indicated, and are Compiled in Volume 17 of Vernon's Annotated Civil Statutes of Texas)

**Art. 6014. "Waste"**

The production, storage or transportation of crude petroleum oil or of natural gas in such manner, in such amount, or under such conditions as to constitute waste is hereby declared to be unlawful and is prohibited. The term "waste" among other things shall specifically include:

(a) The operation of any oil well or wells with an inefficient gas-oil ratio, and the Commission is hereby given authority to fix and determine by order such ratio provided that the utilization for manufacture of natural gasoline of gas produced from an oil well within the permitted gas-oil ratio shall not be included within the definition of waste.

(b) The drowning with water of any stratum or part thereof capable of producing oil or gas, or both oil and gas, in paying quantities.

(c) Underground waste or loss however caused and whether or not defined in other subdivisions hereof.

(d) Permitting any natural gas well to burn wastefully.

(e) The creation of unnecessary fire hazards.

(f) Physical waste or loss incident to, or resulting from, so drilling, equipping, locating, spacing or operating well or wells as to reduce or tend to reduce the total ultimate recovery of crude petroleum oil or natural gas from any pool.

(g) Waste or loss incident to, or resulting from, the unnecessary, inefficient, excessive or improper use of the reservoir energy, including the gas energy or water drive, in any well or pool; however, it is not the intent of this Act to require repressuring of an oil pool or that the separately owned properties in any pool be unitized under one management, control or ownership.

(h) Surface waste or surface loss, including the storage either permanent or temporary of crude petroleum oil, or the placing any product thereof, in open pits or earthen storage, and all other forms of surface waste or surface loss, including unnecessary or excessive surface losses, or destruction without beneficial use, either of crude petroleum oil or of natural gas.

(i) The escape into the open air, from a well producing both oil and gas, of natural gas in excess of the amount which is necessary in the efficient drilling or operation of the well.

(j) The production of crude petroleum oil in excess of transportation or market facilities or reasonable market demand. The Commission may determine when such excess production exists or is imminent and ascertain the reasonable market demand.

The Commission may consider any or all of the above definitions, whenever the facts, circumstances or conditions make them applicable, in making rules, regulations or orders to prevent waste of oil or gas.

Nothing in this Section shall be construed to authorize limitation of production of marginal wells, as such marginal wells are defined by Statute, below the amount fixed by Statute for such wells. (Acts 1919 p. 285; Acts 1929, 41st Leg., p. 694, ch. 313; Acts 1931,

42nd Leg., 1st C. S., p. 46, ch. 26, par. 1; Acts 1932, 42nd Leg., 4th C. S., p. 3, ch. 2, par. 1; Acts 1935, 44th Leg., p. 180, ch. 76, par. 2.)

#### **Art. 6029. Rules and regulations.**

The Commission shall make and enforce rules, regulations or orders for the conservation of crude petroleum oil and natural gas and to prevent the waste thereof, including rules, regulations or orders for the following purposes:

(1) To prevent the waste, as hereinbefore defined, of crude petroleum oil and natural gas in drilling and producing operations and in the storage, piping and distribution thereof.

(2) To require dry or abandoned wells to be plugged in such way as to confine crude petroleum oil, natural gas, and water in the strata in which they are found and to prevent them from escaping into other strata.

(3) For the drilling of wells and preserving a record thereof.

(4) To require wells to be drilled and operated in such manner as to prevent injury to adjoining property.

(5) To prevent crude petroleum oil and natural gas and water from escaping from the strata in which they are found into other strata.

(6) To establish rules and regulations for shooting wells and for separating crude petroleum oil from natural gas.

(7) To require records to be kept and reports made.

(8) It shall do all things necessary for the conservation of crude petroleum oil and natural gas and to prevent the waste thereof, and shall make and enforce such rules, regulations or orders as may be necessary to that end.

(9) To provide for the issuance of permits, tenders, and other evidences of permission when the issuance of such permits, tenders, or permission is necessary or incident to the enforcement of its rules, regulations, or orders for the prevention of waste. (Acts 1919, p. 285; Acts 1931, 42nd Leg., 1st C. S., p. 46, ch. 26, par. 15; Acts 1932, 42nd Leg., 4th C. S., p. 3, ch. 2 par. 7; Acts 1935, 44th Leg., p. 180, ch. 76. par. 4.)

\*Article 6049 c, Title 102, Revised Civil Statutes,  
\* \* \*

#### Section 7. \* \* \*

In the event any such rule, regulation or order which the Commission may adopt provides for the limitation or fixing of the production of crude petroleum oil, or of natural gas from wells producing gas only, in any pool or portion thereof, the Commission shall distribute, prorate, or otherwise apportion or allocate, the allowable production among the various producers on a reasonable basis. Acts 1935, 44 Legislature, p. 180, ch. 76, sec. 6)

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IN THE

# Supreme Court of the United States

OCTOBER TERM, 1939

No. 681

RAILROAD COMMISSION OF TEXAS ET AL,

*Petitioners*

VS

ROWAN & NICHOLS OIL COMPANY,

*Respondent*

RESPONDENT'S MEMORANDUM BRIEF ON WHETHER  
THE SUIT IS MOOT AND REPLY TO  
AMICI CURIAE BRIEFS

ON WRIT OF CERTIORARI TO THE UNITED STATES  
CIRCUIT COURT OF APPEALS FOR  
THE FIFTH CIRCUIT

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---

Without urging, or intending to be understood as urging, that this case is moot, Respondent's counsel made known to the Court that pending appeal the Railroad Commission had promulgated, and is now enforcing, a new order in the East Texas field, and that such new order has not been enforced to control

production from the lease involved in this suit. (Respondent's Brief, p. 1) Respondent's counsel considered it their duty to disclose such facts.

Following the suggestion of the Chief Justice, Respondent and Petitioners have joined in a stipulation which they believe discloses the pertinent facts in reference to the question as to whether or not the case is moot, and there is appended to the stipulation a copy of the new order.

The decisions of this Court support the proposition that because of the public importance of the questions involved in the case, a change in the order or a suspension of its enforcement would not render the case moot. The fact that the Commission has excepted the lease involved in this case from the force of the new order and is continuing to vigorously prosecute this appeal, indicates that if successful in the appeal the Commission would then apply the plan of proration involved here to control production in the field; or else such fact shows that the Commission considers the new order within the class of orders enjoined by the decree in this case. If the Commission intends to enforce this plan of proration if successful in this suit then the issues are a subject of real controversy between the parties, and the case is not moot; or if the new order is within the class of orders enjoined by the decree, the case is not moot. It would only be logical to assume that if the Commission had determined to finally abandon the method of proration now under attack, that it would not carry on in its efforts to sustain as valid that method of proration, unless it considers the new order within the class of orders enjoined by the decree. Independent of the public

importance of the issues and the future policy of the Commission, it seems certain that the new order could not possibly render the case moot if the difference between the plan of proration here involved and the plan provided by the new order, when applied to the Respondent's lease, have substantially the same effect in respect to the opportunity afforded Respondent to recover its fair share of the oil. There is a difference in the language of the two orders, and the new order increases the total of the daily field allowable; but a comparison of the effect of the new order, as shown by the stipulated facts, when applied to Respondent's lease with the effect that the plan of proration involved in this case had on Respondent's lease fails to show that the new order would substantially improve Respondent's situation in relation to the opportunity afforded Respondent to recover its fair share of the oil.

Under the plan of proration here involved Respondent was allowed to produce daily from its lease 100 barrels on the basis of the 20 barrel minimum per well; and in addition Respondent was allowed to produce daily from the lease, as its part of the 7,000 barrels of proratable oil, 11.83 barrels, or 1 barrel out of every 592 barrels of proratable oil. Under the new order Respondent would be allowed to produce daily 100 barrels on the basis of the 20 barrel minimum; and in addition thereto Respondent would be allowed to produce daily from its lease, as its part of the 176,000 barrels of proratable oil, 105 barrels, or only 1 barrel out of every 1676 barrels of proratable oil. These facts appear from the record in this case and the stipulated facts.

The method of proration involved in this case allowed all wells that could not make as much as 20 barrels per day to produce to the maximum of their capacity, and allocated to all wells capable of producing 20 barrels of oil or more per day a minimum allowable of 20 barrels per day. These allocations disposed of all but approximately 7,000 barrels of the daily field allowable of 522,500 barrels, and the 7,000 barrels so remaining was divided among some 6,325 wells having hourly potentials in excess of 865 barrels. (R., 970-971) This method of proration placed all wells having daily potentials of only 20 barrels and all wells having hourly potentials up to 865 barrels (in excess of 20,000 barrels per day) on the same basis for production. The method did not provide for adjustment of allowables on the basis of density of drilling of leases or comparative reserves of leases. Under this method of proration, a 10-acre lease with 10 wells was allowed to produce five times as much oil per day as an adjoining 10-acre lease with 2 wells, although the two leases had the same sand thickness, reserves, pressures, and position on the structure.

The stipulation accompanying the copy of the new order shows that the field allowable for producing days is fixed at approximately 690,000 barrels of oil; that each well in the field that cannot make as much as 20 barrels per day is allowed to produce to the maximum of its capacity the same as under the prior order; that each well in the field capable of producing more than 20 barrels of oil per day is granted a minimum allowable of 20 barrels per day the same as under the prior order; that these allocations dispose of all but approximately 176,000 barrels of the daily field allowable of approximately 690,000 barrels; that

such 176,000 barrels is prorated among wells by a factor (see par. (b) 3 of Rule 23, Appendix to Stipulation) that takes into account well potentials, bottom-hole pressure, sand thickness and acreage. The Commission has excepted the lease involved in this case from the force of the new order, and is currently allowing Respondent to produce from that lease under the terms of the decree in this suit.

The plan involved here allowed Respondent's lease to produce daily 111.83 barrels per day (R., 977). 100 barrels of this allowable was the result of the per well minimum of 20 barrels; 11.83 barrels was Respondent's part of the 7,000 barrels of field allowable that was not distributed to the small wells and on the 20 barrel per well minimum. This 11.83 barrels allocated to Respondent's wells over and above the amount allocated to them on the 20-barrel minimum, represented .171% of the 7,000 barrels of proratable oil. Under the new order Respondent's lease would be allowed to produce approximately 205 barrels per day. (See Stipulation) 100 barrels of this would be the result of the per well minimum of 20 barrels; 105 barrels would be Respondent's part of the 176,000 barrels of field allowable that is not distributed to the small wells and on the 20-barrel per well minimum. That is to say, under the new order Respondent's lease would be allowed only .060% of the 176,000 barrels of proratable oil, as compared with .171% of the proratable oil allowed to Respondent under the plan of proration here involved. The field allowable has been increased and Respondent's total daily production would be increased, but the 20-barrel minimum would be continued in force and Respondent's lease would receive a lesser per cent of the 176,000



barrels prorated under the formula of the new order than the per cent of the 7,000 barrels received by Respondent under the prior order. Under the plan of proration here involved Respondent's lease was allowed to produce daily .0214% of the daily field allowable, while under the new order Respondent would be allowed to produce .0297% of the daily field allowable. Therefore, the new order would not substantially change Respondent's situation in regard to its opportunity to produce its fair share of the daily field allowable. The new order is cast in different words but it would leave Respondent in substantially the same situation as the plan of proration involved here in so far as according Respondent an opportunity to produce its fair share of the oil.

The vice in the method of proration here involved is the distribution of the principal part of the daily field allowable on a per well basis, ignoring the difference in recoverable reserves and drilling density of leases, and resulting in unreasonable discrimination between leases and in allowing one operator to take the oil of another. The 20-barrel per well minimum that condemns the method of proration under attack here is carried forward in the new order as a basis for distributing among wells a principal part of the daily field allowable. It is only by increasing the daily field allowable from 522,500 barrels to 690,000 barrels that the new order makes available any material quantity of oil for distribution among wells on any basis other than a per well basis. To the extent, at least, that the new order adopted the per well method of distribution, it attempts to enforce the method of proration here involved and has the same infirmity as the plan of proration involved in



this case. The fact that the Commission has excepted the lease in question from the force of the new order may indicate that the Commission construes the new order as coming within the class of orders enjoined by the decrees of the lower Courts.

It is obvious that under the new order, as the number of wells in the field is increased, or as the daily field allowable is reduced to prevent waste, or as both occur, there will be a constantly increasing amount of the daily field allowable distributed among the wells on a per well basis that does not take into account potentials, pressures, sand thickness, acreage or any other factor that measures the reserves of one lease as compared with another.

The comparison of Respondent's situation under the plan of proration here involved with what its situation would be were the new order enforced against it seems to demonstrate that Respondent's situation would be substantially the same under either plan of proration; and that the question of whether or not the case is moot may be disposed of on that basis.

In this connection it should be borne in mind that Respondent sought relief against the existing method of proration and any other that prevented its producing its fair share of the daily field allowable (R., 1-15); and that the trial Court decreed the invalidity of the existing method of proration and restrained enforcement of that method to control production of oil from Respondent's lease, and also enjoined Petitioners from enforcing "any such plan of proration or allocation of field allowable among wells as said orders have been interpreted by the Railroad Commission to require" (R., 77-78).

Respondent believes that authorities hereinafter cited and quoted from demonstrate that the suit is not moot.

*United States vs Trans-Missouri Freight Association*, 166 U. S. 290, 307-309, was a suit by the United States against the Freight Association, having for its purpose the securing of a judgment declaring the agreement between the members of the Association violative of the Sherman Anti-Trust Act and dissolving the Association. Judgment of the trial Court dismissing the bill was affirmed by the Circuit Court of Appeals. After the judgment was entered by the trial Court, the Association was dissolved by a vote of its members and thereafter a motion to dismiss the appeal was filed in the Supreme Court of the United States. In holding that the case was not moot, the Court, speaking through Mr. Justice Peckham, said:

\* \* \* "The mere dissolution of the association is not the most important object of this litigation. The judgment of the court is sought upon the question of the legality of the agreement itself for the carrying out of which the association was formed, and if such agreement be declared to be illegal, the court is asked not only to dissolve the association named in the bill, but that the defendants should be enjoined for the future."

\* \* \* "Here, however, there has been no extinguishment of the rights (whatever they are) of the public, the enforcement of which the Government has endeavored to procure by a judgment of a court under the provisions of the act of Congress above cited. The defendants cannot foreclose those rights nor

prevent the assertion thereof by the Government as a substantial trustee for the public under the act of Congress, by any such action as has been taken in this case."

Compare *United States of America vs Hamburg-American Co.*, 239 U. S. 466, 475, et seq.

In *Southern Pacific Terminal Co. vs Interstate Commerce Commission et al*, 219 U. S. 498, 514-516, appellant sought an injunction to restrain enforcement of an order of the Interstate Commerce Commission requiring the appellant to cease and desist, on or before a certain date, and for a period of not less than two years thereafter, from granting undue preferences and advantages to a certain shipper. After the two years had past it was contended that the order of the Commission had expired and that the case had thereby become moot and the appeal should be dismissed. In overruling this contention the Court, speaking through Mr. Justice McKenna, said:

\* \* \* "The case at bar comes within the rule announced in *United States vs Trans-Missouri Freight Assn.*, 166 U. S. 290, 308, and *Boise City Irr. & Land Co. vs Clark* (C. C. App., 9th Cir.), 131 Fed. Rep. 415.

"In the case at bar the order of the Commission may to some extent (the exact extent it is unnecessary to define) be the basis of further proceedings. But there is a broader consideration. The questions involved in the orders of the Interstate Commerce Commission are usually continuing (as are manifestly those in the case at bar) and their consideration ought not to be, as they might be, defeated, by short term orders, capable of repetition,

yet evading review, and at one time the Government and at another time the carriers have their rights determined by the Commission without a chance of redress."

In *Southern Pacific Co. vs Interstate Commerce Commission*, 219 U. S. 433, 452, the Railway Company sought to enjoin the enforcement of an order of the Interstate Commerce Commission requiring the Company to cease from charging a certain rate. The claim was made that the suit was moot. The language used by the Court in disposing of the contention in that case is peculiarly interesting in this case because of the contention made by the Attorney General in oral argument that if the order involved in this case is valid, the Railroad Commission would attempt to charge against future production of Respondent the amount of oil produced by Respondent under the decree in this case over and above the allowable fixed by the Commission. In disposing of the question in that case the Court, speaking through Mr. Chief Justice White, said:

\* \* \* "It is claimed at bar that the questions arising for decision are moot, since in consequence of the lapse of more than two years since the order of the Commission became effective, by operation of law the order of the Commission has spent its force, and therefore the question for decision is moot. The contention is disposed of by *Southern Pacific Terminal Co. vs Interstate Commerce Commission*, this day decided, *post*, p. 498. In addition to the considerations expressed in that case it is to be observed that clearly the suggestion is without merit, in view of the possible liability for reparation to which the railroads might be subjected if the legality of

the order were not determined and the influence and effect which the existence of the rate fixed for two years, if it were legal, would have upon the exercise by the railroads of their authority to fix just and reasonable rates in the future, clearly causes the case to involve not merely a moot controversy."

*McGrain vs Daugherty*, 273 U. S. 135, 181, involved an appeal from a final order of the District Court, in *habeas corpus*, discharging Daugherty from the custody of McGrain, deputy sergeant at arms of the Senate, by whom Daugherty had been arrested, as a contumacious witness, under a warrant of attachment issued by the President of the Senate in pursuance of a Senate resolution. The point was made that after the Congress which initiated the investigation expired that the case became moot. The Court, speaking through Mr. Justice Van Devanter, overruled the contention, saying:

\* \* \* "So far as we are advised the select committee having this investigation in charge has neither made a final report nor has been discharged; nor has it been continued by an affirmative order. Apparently its activities have been suspended pending the decision of this case. But, be this as it may, it is certain that the committee may be continued or revived now by motion to that effect, and, if continued or revived, will have all its original powers. This being so, and the Senate being a continuing body, the case cannot be said to have become moot in the ordinary sense. The situation is measurably like that in *Southern Pacific Terminal Co. v. Interstate Commerce Commission*, 219 U. S. 498, 514-516, \* \* \*. Our judgment may yet be carried

into effect and the investigation proceeded with from the point at which it apparently was interrupted by reason of the habeas corpus proceedings. In these circumstances we think a judgment should be rendered as was done in the case cited."

In *Leonard & Leonard vs Earle*, 279 U. S. 392, 398, this Court, speaking through Mr. Justice McReynolds, held that an action in mandamus to compel a state officer to license plaintiff's business for the ensuing year without his complying with statutory conditions which he claimed were unconstitutional did not become moot with the expiration of that year, in view of the nature of the controversy and the stipulation of the parties that it was plaintiff's purpose to continue in business.

*Newport News Ship Building & Dry Dock Co. vs Schauffler*, 303 U. S. 54, 58, involved a bill which sought to restrain officials of the National Labor Relations Board from holding a hearing upon a complaint issued against the ship building company. The complainant contended that an injury would result from the hearing. The Circuit Court of Appeals refused to grant an injunction staying action by the Board pending appeal. An application for a stay was made to a Justice of the Supreme Court and refused. Thereupon a hearing was held before the trial examiner of the Board and was apparently closed. In answer to the contentions that the suit was moot the Court, speaking through Mr. Justice Brandeis, said:

\* \* \* "To the extent that relief was sought to prevent the injury resulting from a hearing the cause appears to be moot. But the cause cannot be disposed of as moot, as the



trial examiner has not yet made his report to the Board; the Board has made no decision; and thus there is a possibility of further proceedings."

*Boise City Irrigation & Land Co. vs Clark* (9th Cir.), 131 Fed. 415, 418, cited with approval on the point here discussed in *Southern Pacific Terminal Co. vs Interstate Commerce Commission*, 219, U. S. 498, 515, was a suit having for its purpose the annulling of an order made by Water Commissioners fixing a maximum rate to be charged by the complainant for water delivered from its canal system to customers thereof for the irrigating season of the year 1901. In that case the Court said:

\* \* \* "It is contended on the part of Appellees that, as the period for which the rate in question was fixed has expired, the case has become but little, if any, more than a moot case; but the courts have entertained and decided such cases heretofore, partly because the rate, once fixed, continues in force until changed as provided by law, and partly because of the necessity or propriety of deciding some question of law presented which might serve to guide the municipal body when again called upon to act in the matter."

It appears to be the law that where a case challenging an administrative order involves questions that are of public importance and are continuing in their nature, a change in the order will not render the case moot. This is illustrated by the fact that this Court has held that suits to enjoin enforcement of short term orders of the Interstate Commerce Commission do not become moot upon expiration of the terms of such

orders. This ruling is based upon the principles that such orders involve public rights and that the decision may influence future rates or be the basis of further proceedings or reparation. Final review by the Supreme Court should not be continuously defeated by the successive expiration of such orders. If it were possible to so defeat the jurisdiction and final decision of this Court on the validity of administrative orders, then administrative bodies could adopt the device of limiting the terms of their orders or from time to time, in the face of litigation, making changes in their orders and thereby effectively prevent judicial review of regulatory orders.

The rule adopted by this Court in suits involving short term orders of the Interstate Commerce Commission that such suits are not rendered moot by the expiration of the terms of such orders seem peculiarly applicable in the instant case. Especially do they appear applicable in view of the Attorney General's statement in oral argument that, if the trial Court and Circuit Court judgments are reversed and the order upheld, the Commission has the right to charge against Respondent's future production the amount of oil produced under the decree in excess of the amount allowed under the Commission's regulation. Such a charge would be comparable to reparations in rate cases.

If the case were held moot and remanded with instructions to dismiss, then, apparently, the Commission would attempt to charge past production against Respondent's future allowable or make claim for penalties and thereby further litigation would be incited. If the case is held to be moot then, in view

of this position taken by the Attorney General, the last judgment, being that of the Circuit Court of Appeals, should be allowed to stand.

The Amici Curiae briefs filed a day or two before submission on oral argument make substantially the same approach to the case as was made in Petitioners' brief. Respondent ask leave to reply.

Amici Curiae, like Petitioners, argue this suit on the basis of excerpts from the testimony without directly attacking the sufficiency of the evidence to support the findings of the trial Court. It was in connection with this approach by Petitioners that Respondent directed attention to the fact that Petitioners did not except to or ask modification of the findings, and Petitioners' replied by citing Rule 52 (a) of the Rules of Civil Procedure. One of the Amici Curiae cited the rule, but neither Petitioners nor Amici Curiae quoted the provisions of the Rule to the effect that the findings of the trial Court shall not be set aside unless clearly erroneous and that due regard shall be given to the opportunity of the trial Court to judge the credibility of the witnesses. Petitioners did claim in their reply brief the right to challenge the sufficiency of the evidence to support the findings because they have specified error on the holding of the lower courts to the effect that the proration orders of the Commission are arbitrary and unreasonable and that Respondent showed itself to be injured by the method of proration involved. These specifications are not of that specific character required by the Rules of this Court. (See Rule 9; par. 2(e) of Rule 27; par. 2 of Rule 38) The specifications of error relied upon would be as appropriate, and even

more so, to support an argument that the findings are not sufficient to support the judgment. It is our understanding that on certiorari this Court will only consider the errors specified in the Petition, except errors of the most apparent nature. (*Zellerbach Paper Company vs Helvering*, 293 U. S. 172, 182.)

The argument not only overlooks the fact that Petitioners failed to specify as error that the evidence does not support the findings, but also overlooks the fact that the findings of the trial Court were not disturbed by the Circuit Court of Appeals, and that it is the rule of this Court that findings will not be disturbed that have been concurred in by two lower Courts in the absence of a clear showing that they are erroneous. (*Texas and New Orleans Railroad Company et al vs Brotherhood of Railway & Steamship Clerks, et al.*, 281 U. S. 548, 558; *United States vs Commercial Credit Co., Inc.*, 286 U. S. 63, 67)

Arguments of the Amici Curiae and of Petitioners seem to proceed upon the theory that this Court will examine the testimony and if there is found therein substantial basis to support the action of the administrative agency, that the action will be upheld. We do not think this rule applies. This suit originated as a bill in equity to enjoin enforcement of a method of proration on the ground that as enforced and applied to control production of oil from Respondent's lease the method was discriminatory and operated to confiscate Respondent's property in violation of the Fourteenth Amendment to the Constitution of the United States. In such a case a judicial review of the law and facts is guaranteed by the due process clause, contemplating that the Courts will make an independent determina-

tion of the facts and draw independent conclusions and inferences therefrom. (*Saint Joseph Stock Yards Co. vs. United States*, 298 U. S. 38, 51; *Ohio Valley Water Co. vs Benavon Borough*, 253 U. S. 287, 289; *Bluefield Water Works Co. vs Public Service Commission*, 262 U. S. 679; *State vs Wichita Gas Co.*, 290 U. S. 561, 569) and, on certiorari to a United States Circuit Court of Appeals in such a case, this Court, as in *Standard Oil Co. vs Maryville*, 279 U. S. 582, 584, will not go beyond findings to which the petitioners have not offered serious challenge. The findings of the trial Court show that the method of proration involved is confiscatory, and so arbitrary as to be without rational basis. Even were the Court to look beyond the findings, to the testimony, it will appear therefrom that the findings are supported by evidence which demonstrates virtually beyond dispute the unreasonableness and injustice of the method of proration applied and enforced to control production from Respondent's lease.

On oral argument a question was asked as to whether or not the proceedings before the Commission were a part of the record. This question was answered in the affirmative by counsel for Petitioners and it now appears that such answer may be misleading. Apparently the Court had in mind one Commission proceeding, and counsel for Petitioners another. The Court apparently had in mind the proceedings preliminary to the Commission's adopting the method of proration here involved. Counsel for Petitioners, being familiar with the record, must have had in mind the proceedings before the Commission in connection with Respondent's petition for adjustment of allowables. A. H. Rowan, a witness for Respondent, testified that applications had been made

to the Commission for adjustments in well allowables. (R., 127-129). In connection with this testimony, Respondent offered in evidence (R., 129) the proceedings before the Commission on the application for adjustment of allowables (R., 718-858). The purpose of this testimony was to show that Respondent had protested the method of proration involved and had exhausted its administrative remedies. This was the only record of proceedings before the Commission that was offered in evidence on the trial of this case.

The briefs question the provision of the trial Court's decree that "Respondents (Petitioners here), their agents, servants, employees and representatives, are restrained from interfering with Complainant (Respondent here) in daily producing from the wells on its said lease \* \* \* the amount of oil which bears to the daily field allowable fixed by the Railroad Commission the ratio which 220 barrels bears to 522,000 barrels \* \* \*." (R., 78) This provision of the decree was amended by the Circuit Court of Appeals as follows:

\* \* \* "In order to remove any doubt as to the temporary character of the ratio fixed by the District Court, the judgment will be amended to read 'without prejudice to the right of the Commission to enter a reasonable proration order and to fairly enforce it.'"  
(Tr., 110)

In asking equitable relief, Respondent did not pray for an injunction that would permit it to produce oil from its wells without restriction, but asked that the Commission be restrained from interfering with Respondent in producing its fair share of the oil. (R.,



14-15) The trial Court pointed out this fact (R., 75), and limited the effect of the injunction by the questioned provision of the decree. In this connection see *City of Toledo vs Toledo Ry. & Light Co.* (Sixth Circuit) 259 Fed. 450, 458, where the Court said:

"It is also urged that the making of rates for public service is not a judicial function, and that the court has no power to make rates. It is true enough that the direct power of the courts on this subject is negative and not affirmative. *Reagan vs Farmers' Co.*, 154 U. S. 362, 400, 14 Sup. Ct. 1047, 38 L. Ed. 1014. To say that a specified rate is invalid because confiscatory is always to say that any lower rate will also be invalid, and sometimes the facts will be such that, in order to decide whether the rate in question is unlawful, the court must first determine with some accuracy what would be the minimum reasonable return. It is likewise plain that, when an injunction is asked to restrain the enforcement of an unreasonable rate, the court may make its granting conditional upon the doing of equity by plaintiff, and thus may require the plaintiff to consent to charge no more than what seems to the court to be reasonable—just as, in tax injunction cases, the plaintiff is often required to pay what the court thinks a fair tax before it will give relief against the excessive part."

See also *Public Service Ry. Co. vs Board of Public Utility Commissioners*, 276 Fed. 979, 990, where the Court said:

"As the court is not presently concerned with the lawfulness of the 10 cent rate no temporary injunction affecting that rate will

be awarded. As the court has found against the lawfulness of the rate of 7 cents plus 2 cents it is clear that the injunction must restrain the enforcement of that rate. But if the court were to do nothing more, the effect of such an injunction would be to annul the rate of 7 cents plus 2 cents, thus re-establishing the previous rate of 7 cents plus 1 cent or leaving established no rate at all. This would be doing injury rather than equity to the complaining party. Anticipating that the court might name a new rate as a condition of an injunction against the old one, counsel for the Board have quite pertinently called the court's attention to the fact that it is not a rate-making body and have made the point that if the court name a rate as a condition for granting an injunction, it would, in effect, fix a new rate and would thereby exceed its function. *That it would exceed its function as a rate-making body is very true, because, not being such a body, it has no such function. But that in so doing it would exceed its power as a court of equity is not true.* Injunction is one of the equitable remedies over which the court has jurisdiction. The remedy of injunction may be granted in the terms of the prayer or it may be granted only upon condition that the party seeking equity shall do equity, as in this instance, that the Company shall consent to charge a fare no greater than what the court deems necessary to avoid confiscation. If the naming of a condition is in effect the fixing of a rate, the sanction for the court's act is in the injunction and in the circumstances that make injunction imperative. This rule is ancient and of wide application. *Walden vs Bodley*, 14 Pet. 156, 164, 10 L. Ed. 398; *State R. R. Tax Cases*, 92 U. S. 575, 23 L. Ed. 663; *Cummings vs National Bank*, 101 U. S. 153,

25 L. Ed. 903; People's National Bank vs Marye, 191 U. S. 272, 282-288, 24 Sup. Ct. 68, 48 L. Ed. 180; Amarillo vs Southwestern T. & T. Co., 253 Fed. 638, 165 C. C. A. 264; Toledo vs Toledo R. & L. Co., 259 Fed. 450, 458, 170 C. C. A. 426; Consolidated Gas Co. vs Newton (D. C.), 267 Fed. 231, 272, 274."

The amendment of the judgment by the Circuit Court of Appeals ought to set at rest the questions raised concerning that part of the decree so brought in question. The term "to remove any doubt as to the temporary character of the ratio fixed," as used by the Circuit Court of Appeals in the amendment, appears to mean that the ratio is to be effective pending this appeal or the Commission's entering a proration order and enforcing it in a manner that does not contravene the judgment of the trial Court as amended and affirmed by the Circuit Court of Appeals.

However, the decree could be construed as a finding by the trial Court that Respondent is under the laws of Texas entitled to produce according to the ratio stated in the decree, and as so construed the judgment can be sustained. The trial Court's first problem was to determine what Respondent's property rights were and in determining whether Respondent was or was not allowed an equal opportunity with others for developing and realizing for its leasehold, it became necessary for the trial Court to determine what would be required, within a reasonable degree, to give Respondent such an equal opportunity. If the trial Court determined that on a field allowable of 522,000 barrels Respondent, in order to have an equal opportunity with others, would have to produce approximately 220 barrels of oil daily; that was a method

of determining Respondent's rights and that the existing order did deny to Respondent its rights and resulted in depriving Respondent of its property. If the trial Court so determined, it was proper that the trial Court enjoin the existing method of proration and it was legitimate for the trial Court to enter a decree that stated Respondent's rights and protected them. It was also legitimate that the trial Court enjoin any other order, as long as existing conditions continued, that would restrain Respondent from producing in accordance with its right as found by the trial Court. This position is sustained by well considered cases, and does not involve the Courts' substituting their judgment for that of an administrative agency or the Courts' attempting to exercise the functions of an administrative agency. Cases hereafter cited and quoted from, support this proposition.

In *City of Toledo vs Toledo Ry. & Light Co.*, 259 Fed. 450, 458, the Court said:

\* \* \* "To say that a specified rate is invalid because confiscatory is always to say that any lower rate will also be invalid, and sometimes the facts will be such that, in order to decide whether the rate in question is unlawful, the court must first determine with some accuracy what would be the minimum reasonable return. \* \* \* In any of these instances, there is an indirect fixing or determination by the court, but each of these indirect results is fully within the judicial power."

In a rate suit final adjudication on value of property and the reasonableness of the rate is, pending some change in conditions, *res judicata* between the parties on those questions. In this suit it was necessary in

determining the reasonableness of the attempted regulation, that the Court find the quality, extent and nature of Appellee's property right and the extent to which the regulatory agency might, under the facts, lawfully regulate or restrict enjoyment of this property right. Determination of these matters is necessary to a determination of the ultimate issue of reasonableness or legality of the regulation in question. Having determined these matters, is a court of equity denied the power to protect the injured party by entering a decree that expresses these determinations? Is the successful litigant to be protected by a decree that declares his rights and gives the regulatory body to understand what those rights are, or is he to see one regulation invalidated and, for the want of a judicial declaration of his rights, hoisted on the lance of another invalid regulation adopted by the regulatory body in its trial and error method of attempting to adopt valid regulations? Such a rule would be productive of litigation and extremely oppressive on a property owner, particularly when dealing with an incompetent or contumacious regulatory agency. There is not anything so sacrosanct about an administrative body exercising legislative functions that a Court may not appropriately, in holding a given rate confiscatory, also enjoin any rate of less than a stated amount and so give the property owner protection of full equitable relief. The Court should not be confined merely to finding the right and that the right is being violated; but the Court should be allowed to go further and say on the testimony how far regulation may be imposed without violating the right. To say that a Court may determine that a given rate is confiscatory, but may not at the same time say that on the evidence a rate yielding less



than a certain return would also be confiscatory, is to deny to the parties, including the regulatory body, the benefit of a complete adjudication of the questions presented, as in this suit for the Court to deny to itself the power to define the extent to which Respondent's property may be regulated under the evidence and conditions shown to exist is to deny itself the power to completely adjudicate the questions presented. So, in a suit like this, when on the evidence the Court is able to determine the rights of the parties, it would not be an exercise of power in excess of the power properly reposed in the judiciary for the Court to define the limits of valid regulation by saying that under conditions existing at the time of the trial any order that reduced production substantially below a given amount would be destructive of property rights, and so give the Commission a practical guide in attempting to perform its duties, rather than return the question to the Commission with no better standard of guidance than the general principle that a regulatory order must be reasonable.

In *Ottinger vs Consolidated Gas Co.*, 272 U. S. 576, the Gas Company attacked a rate as being confiscatory. The lower Court enjoined the rate because confiscatory and because its enforcement would impair the Gas Company's contract with the State contrary to Article I, section 10, of the Constitution of the United States. The conclusion of the Master, confirmed by the lower Court, was that the prescribed rate of \$1.00 per thousand feet would not yield a return of 6%, and was, therefore confiscatory. The Supreme Court modified the decree of the District Court by excluding therefrom those parts which declared the rate invalid for any reason except enforcement would



result in confiscation, and, as so modified, affirmed the decree of the trial Court. The result of that case was, in effect, to say that in prescribing rates for the Gas Company, a rate must be fixed that will yield a return of not less than 6% on the value of the Gas Company's property. And, in this suit the judgment of the trial Court could be construed as decreeing that a Commission order which under existing circumstances restricts Respondent to substantially less than a certain amount of production would be confiscatory, and as so construed could be sustained as an exercise of judicial power within constitutional limitations.

*Duluth St. Ry. Co. vs Railroad and Warehouse Commission*, 4 Fed. (2d) 543, 550, was a suit for injunction by the Railroad Company against the Commission to enjoin enforcement of an order fixing a rate of fare in the city of Duluth. The case came on for hearing upon exceptions to the report of a Special Master. The Court modified certain findings of the Master in that case and after so modifying them overruled the exceptions and stated:

"While the foregoing modifications in the findings of fact of the master have seemed to me to be necessary, yet they do not, in my judgment, necessitate any change in the final conclusion reached by the master, but rather strengthen and confirm that conclusion, viz., that the enforcement of the order of the Commission of July 13, 1923, would deprive plaintiff of its property without just compensation; and that to earn a sufficient return to avoid confiscation, plaintiff must be permitted to charge and collect 6 cents for each passenger carried by it in the city of Duluth."

That case was before the Supreme Court of the United States under the style of *Railroad and Warehouse Commission vs Duluth St. Ry. Co.*, 273 U. S. 625, and although the part of the trial Court's opinion quoted above is not referred to in the opinion of the Supreme Court, the trial Court's decree was affirmed.

Respondent's right to protection against a per well method of proration which allows adjoining tracts of comparable reserves to produce more or less oil in comparison one with the other, depending upon density of drilling, has been recognized by the Courts of Texas and by courts of federal jurisdiction. The right was recognized in *Brown vs Humble Oil & Refining Co.*, 126 Tex. 26, 309, 312; 83 S. W. (2d) 935, 942, 944, where the Court said that it was proper for the Commission to adjust allowable so as to give the owner of the smaller tract only his just proportion of the oil and gas. In *Magnolia vs Blankenship*, (5th Cir.), 85 Fed. (2d) 553, 555; writ refused, 299 U. S. 608, the Court, speaking through Judge Sibley, pointed out that the proper remedy for an owner of land adjacent to a small or densely drilled area was to seek before the Commission an adjustment of allowables.

In *Peoples' Petroleum Producers, Inc., vs Smith*, 1 Fed. Sup. 361, 365, the Court, speaking through Judge Hutcheson, condemned a per well method of proration in the East Texas field in the following language:

\* \* \* "in direct contravention of the statute, instead of justly and equitably distributing the reduction ordered, it has, through its per well requirement, so arbitrarily, unjustly, and in a confiscatory way distributed it, as that it

will inevitably take the oil of plaintiffs, situated as they are most favorably on the structure, to give it to others not so favorably situated."

In conclusion, Respondent submits that its pleadings having attacked the proration order of August 29, 1939, and any extensions and renewals continuing in effect the confiscatory plan of proration complained of, and the Court having fully tried the issue and enjoined said order and any subsequent order continuing in effect such plan of proration, the issuance of the new order, changed in form but not as to substance, still denying to Respondent the present use and enjoyment of its property, still denying to it the right to equal opportunity with other operators to produce its fair share of the daily allowable so that it can recover the recoverable oil in place under its lease, or the equivalent thereof, just as effectively as the first order did, does not render this case moot.

Petitioners and Amici Curiae fail to point out a single issue or finding and then argue a lack of evidence to support it. Their strategy has been to single out excerpts from the testimony alone, place their own interpretation thereon, and ignore in toto practically every finding of the Court to the contrary. The lack of reference by Petitioners and Amici Curiae to the findings of fact are most conspicuous in this case. To remove any doubt that may arise in the minds of the Court, Respondent in its brief made reference to evidence supporting every finding of importance. However, the admission in the pleadings of Petitioners that the Commission does not consider in this particular field the reserves under

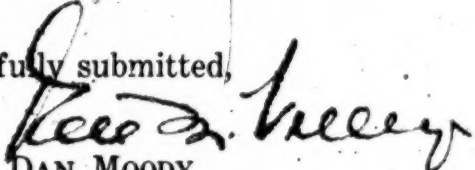
leases or density of drilling (R., 54); is sufficient to strike down the order, affecting Respondent, adversely, as it does. (R., 987)

Respondent has approximately as much oil in place as ever, but not nearly as much **recoverable** oil, due to the slow but inevitable approach of the water. There was testimony that under the present plan of proration the water drive is flushing the oil from under Respondent's lease and causing the oil to move up-structure to the East, and that water will take Respondent's lease before Respondent can under the present plan of proration produce an amount of oil substantially equivalent to the reserves of its lease. The water drive that is forcing oil under Respondent's lease is also flushing oil from Respondent's lease up-structure to the East. The movement of oil to the East is taking place faster than Respondent is allowed to produce under the present plan of proration, with the result that Respondent will be prevented from recovering an amount of oil substantially equivalent to the oil originally in place under the lease. The effect of the water driving oil to the East causes the difference between oil in place and recoverable oil. The trial Court found that it is rank speculation to say that Respondent will ever recover an amount of oil equivalent to that originally in place or now in place under Respondent's lease. The trial Court further found that Respondent has produced some 200,000 barrels less of oil than it would have produced had Respondent been allowed to produce in relation to its reserves. Had not the trial Court granted it some effective relief, Respondent's losses would have mounted higher while the Commission promulgated monthly orders. The Court could have granted an unlimited injunction, but in

order to do equity to Respondent and all other operators, under its unquestioned equity powers, it limited its injunction pending appeal or the issuance of a valid order. The amount of oil fixed in the trial Court's decree is immaterial. The Court could have fixed 500 instead of 220 barrels, and the Petitioners could not have complained, because such limiting of the injunction redounded to their benefit.

Respondent therefore respectfully submits that the case is not moot, and urges that the judgment of the Circuit Court of Appeals for the Fifth Circuit be in all things affirmed.

Respectfully submitted,

  
 DAN MOODY,  
 RICE M. TILLEY,  
*Attorneys for Respondent.*

### ACKNOWLEDGEMENT OF SERVICE

Service of the foregoing memorandum brief for Respondents is acknowledged, this the \_\_\_\_\_ day of May, 1940.

\_\_\_\_\_  
*Attorney for Petitioners.*

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FILED

APR 22 1940

CHARLES ELMORE CROPLEY  
CLERK

IN THE  
**Supreme Court of the United States**  
OCTOBER TERM, 1939

\_\_\_\_\_  
No. 681  
\_\_\_\_\_

RAILROAD COMMISSION OF TEXAS, ET AL.  
*Petitioners,*  
V.

ROWAN & NICHOLS OIL COMPANY,  
*Respondent.*

\_\_\_\_\_  
BRIEF OF AMICI CURIAE WITH PETITION  
\_\_\_\_\_/\_\_\_\_\_

J. N. SAYE,  
W. T. SAYE,  
*Attorneys for Amici Curiae.*



i.

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We, the undersigned, attorneys for the respondent, Rowan & Nichols Oil Company, have no objection to the filing of brief amici curiae by J. N. Saye and W. T. Saye, in Cause No. 681, Railroad Commission of Texas, et al, petitioners v. Rowan & Nichols Oil Company, respondent.

RICE M. TILLEY  
DAN MOODY

Dated at Austin, Texas  
on this the 15th day of  
April, 1940.

We, Gerald C. Mann, Attorney General, W. F. Moore, First Assistant Attorney General, and James P. Hart, Assistant Attorney General, hereby consent to the filing by J. N. Saye and W. T. Saye of brief amici curiae in Cause No. 681, Railroad Commission of Texas, et al, petitioners v. Rowan & Nichols Oil Company, respondent.

GERALD C. MANN,

*Attorney General of Texas*

W. F. MOORE,

*First Assistant Attorney General*

JAMES P. HART,

*Assistant Attorney General.*

Dated at Austin, Texas  
on this the 15th day of  
April, 1940.

IN THE  
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OCTOBER TERM, 1939

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No. 681

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RAILROAD COMMISSION OF TEXAS, ET AL,  
*Petitioners,*

V.

ROWAN & NICHOLS OIL COMPANY,  
*Respondent.*

---

Petition for Leave to File  
Brief *Amici Curiae*.

---

The undersigned respectfully petition this Honorable Court for leave to file a brief *amici curiae* in the above entitled suit. Your petitioners respectfully show to the court that they as attorneys represent in excess of fifty persons and corporations owning and operating more than 300 wells located in the East Texas field, all of whom are affected by the orders of

the Railroad Commission attacked in this action. All of these individuals and corporations have pending before the Railroad Commission of Texas a petition for an adjustment of the allowables fixed for their wells. The commission has refused to pass on the petition, stating that no change will be made in its present order until the instant case has been decided. This clearly indicates that the commission contemplates obtaining valuable information from this court's opinion on which to base its next proration order.

It follows that each of the petitioners is vitally interested in a decision of the questions presented in this suit.

Consent to file this brief has been given by counsel for both the petitioners and the respondent in the above entitled cause.

Washington, D. C., April 22, 1940.

Respectfully submitted,

J. N. SAYE,

W. T. SAYE.



IN THE  
**Supreme Court of the United States**  
OCTOBER TERM, 1939

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No. 681

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RAILROAD COMMISSION OF TEXAS, ET AL,  
*Petitioners,*  
V.  
ROWAN & NICHOLS OIL COMPANY,  
*Respondent.*

---

Brief of *Amici Curiae*

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I.

**LANDOWNER'S OWNERSHIP OF OIL IN TEXAS.**

In Texas a landowner not only owns the oil beneath his land but also, by virtue of the "capture rule," he becomes the owner of all oil brought to the surface through his wells. Both rules are subject to such modifications as may be necessary to reasonably

enforce the conservation laws. The rule is stated by a recent decision of the Supreme Court of Texas as follows:

"The common law recognizes no well spacing regulations. At common law the landowner can drill an unlimited number of wells for oil and gas upon his land. Mills & Willingham, Oil & Gas (1926) ¶ 270; Summers, Oil & Gas (1927) 73-76. The adjoining landowner cannot complain if wells are drilled near his boundary line. Under this rule the only way the landowner can protect himself is to drill offset wells. *Prairie Oil & Gas Co. v. State*, 231 S. W. 1088 (Tex. Com. App. 1921); *Hunt v. State*, 48 S. W. (2d) 466 (Tex. Civ. App. 1932); *Kelley v. Ohio Oil Co.*, 57 Ohio St. 317, 49 N. E. 399, 39 L. R. A. 765, 63 Am. St. Rep. 721 (1897); *Barnard v. Monongahela Natural Gas Co.*, 216 Pa. 362, 65 A. 801 (1907). However, this rule has been modified in this state. Title 102, Vernon's Annotated Texas Civil Statutes, and particularly articles 6014, 6029, 6046.

"The rule in Texas recognizes the ownership of oil and gas in place, and gives to the lessee a determinable fee therein. *Lemar v. Garner*, 121 Tex. 502, 50 S. W. (2d) 769; *Humphreys-Mexia Co. v. Gammon*, 113 Tex. 247, 254 S. W. 296, 29 A. L. R. 607; *Wagoner Estate v. Sigler Oil Co.*, 118 Tex. 509, 19 S. W. (2d) 27; *Texas Co. v. Daugherty*, 107 Tex. 226, 176 S. W. 717, L. R. A. 1917F, 989.

"Owing to the peculiar characteristics of oil and gas, the foregoing rule of ownership of oil and gas in place should be consid-

ered in connection with the law of capture. This rule gives the right to produce all of the oil and gas that will flow out of the well on one's land; *and this is a property right*. And it is limited only by the physical possibility of the adjoining landowner diminishing the oil and gas under one's land by the exercise of the same right of capture. The following decisions discuss the law of capture as applied in this state: *Stephens County v. Mid-Kansas Oil & Gas Co.*, 113 Tex. 160, 254 S. W. 290, 29 A. L. R. 566; *H. & T. C. Ry. Co. v. East*, 98 Tex. 146, 81 S. W. 279, 66 L. R. A. 738, 107 Am. St. Rep. 620, 4 Ann. Cas. 827; *Prairie Oil & Gas Co. v. State* (Tex. Comm. App.) 231 S. W. 1088, 1089. Both rules are subject to regulation under the police power of a state." *Brown v. Humble Oil & Refining Co.*, 83 S. W. (2) 935, page 940. (Our italics)

It will be observed from the foregoing quotation the court first states that the rule in Texas recognizes the ownership of oil and gas in place and gives to the lessee a determinable fee therein. In the next paragraph it states that the rule of ownership of oil and gas in place should be considered in connection with the law of capture, and that this rule gives the right to produce all of the oil and gas that will flow out of the wells on one's land; holds that the rule of capture is a property right, and that it is limited only by the physical possibility of the adjoining landowner diminishing the oil and gas under one's land by the exercise of the same right of capture. The court further holds that both rules are subject to modification under the police power of the state.

This is the leading decision by the Supreme Court of Texas bearing on property rights of a landowner in oil and gas since the conservation statute was enacted.

## II.

### VALIDITY OF THE COMMISSION'S ORDERS AND THEIR APPLICATION TO THE RESPONDENT.

Each landowner is entitled to a fair chance to recover the oil and gas in place beneath his land. *Gulf Land Co. v. Atlantic Refining Co.* (Tex. S. Ct.) 131 S. W. (2) 73; *Brown v. Humble Oil & Refining Co.*, *supra*. This does not change the common law rule because prior to proration each man was entitled to protect his property against drainage by drilling offset wells. This same protection is now accorded him by the spacing rule of the commission, which is known as Rule 37. (Tr. 21-23)

The lower courts seem to have assumed that the rule of capture has been abolished. Whether it has or not has a material bearing on the formula required for a valid proration order. To illustrate, in many cases the Railroad Commission might find that existing inequalities could be corrected by granting the complaining party a permit to drill another well rather than follow the tedious and at least uncertain method of determining the amount of oil in place under each lease. We do not believe it can be disputed that the commission would have full authority to do this, because it would eliminate the discrimination and at the same time prevent waste. It is a scientifically established fact that the closer wells are spaced, the greater will be the ultimate recovery of oil from any sand producing field.

*American Institute of Mining and Metallurgical Engineers*, Volume 123, Year 1937, pages 456-459, also Volume 127, Year 1938, pages 544-549. "Analytical Principles of the Spacing of Oil and Gas Wells" by Robert W. Phelps, petroleum engineer for the Union Oil Co. of California, found in *AIME Volume titled Petroleum Development and Technology*, 1928-29, pages 90-103. *Petroleum Production* by Wilbur F. Cloud, published by the University of Oklahoma Press, Norman, Oklahoma, 1937 edition, page 58. We quote from Mr. Cloud as follows:

"The conventional practice used in most fields whereby oil wells are located 660 feet apart or on the center of 10 acre locations regardless of existing pressures, structural position, character of the oil, and sand conditions, is probably the most common economic engineering absurdity employed in the oil industry at the present time. Likewise, the close spacing used in the 'town lot' drilling of parts of such fields as Oklahoma City, Long Beach, Huntington Beach, and Santa Fe Springs, California, as well as in certain salt dome areas of Texas and Louisiana, is equally absurd. Such closely spaced wells usually will yield a high recovery per acre, but the excessive cost of completing and operating so many deep wells will prevent the operators from ever recovering the money invested in such a drilling program."

Again on page 59 quote:

"In fields where the gas pressure is very low and production depends almost entirely upon the force of hydrostatic pressure developed as a result of artesian conditions or natural edge water encroachment, a stag-

gered, or triangular arrangement of well spacing should be used. In such a field the pressure of the water must be high enough to overcome capillary retention and pore friction; and the reservoir should be uniform in texture, as water coning and entrapment of oil may result. When oil is being produced under such conditions, the wells should be spaced close together across the face of the water front and farther apart in the direction of the dip of the reservoir rock."

See also *Petroleum Production Engineering* by Lester Charles Uren, professor of petroleum engineering, University of California, published in 1934. Page 83 quote:

"Maximum ultimate recovery of petroleum from an oil field is secured by systematic and timely drilling of wells, thus deriving the greatest benefit from the relatively high initial gas pressure. Natural gas, dissolved and occluded in the oil under pressure, is the principal motivating agent causing the oil to flow from the reservoir rock into the wells during the early life of most oil fields. Productivity of the wells diminishes as the gas pressure declines. Maximum field pressures are experienced only in wells drilled during the early life of a field. Escape of gas through these early wells leads to rapid decline of field pressure so that later drilled wells have smaller initial and ultimate productions. The oil that these later drilled wells fail to produce, in comparison with the recoveries effected by the earlier wells, is largely left in the sands, drained of its gas and unrecoverable by ordinary flowing and pumping methods. If all



the wells could be completed in time to receive the benefit of the higher field pressures, greater recoveries would unquestionably result."

We quote from page 92 of the same work:

"Many wells in the crowded town-lot sections of the Santa Fe Springs and Long Beach fields of California, for example, are so closely spaced that they will never pay out. A high per acre yield will result from intensive development, but the cost of drilling and operating so many wells will be more than the value of the oil produced. Doubtless, in many closely drilled areas, there will be some profit, though it will be less than it might have been with wider spacing. On the other hand, many of the more conservatively developed fields have been drilled with wells that are too widely spaced for maximum profit. Great areas in Mid-Continent and western American fields have been drilled with an allowance of 10 acres per well, and yet computations indicate that in some cases profits could have been doubled or tripled by adopting closer spacing. Present information does not admit of anything more than speculation on what the aggregate loss has been from the national standpoint, but rough computations based on data from a few fields on which results have been assembled, suggest that it is probably greater than the profit that has been realized on all of the oil thus far produced."

The very latest work bearing on this subject is *The Science of Petroleum*, published by the Oxford University Press, 1938 Edition. From chapter styled

"Fundamental Principles Governing Drainage of Petroleum From Its Reservoir," we quote:

*"Expulsion of Petroleum from the Reservoir Rock by Expanding Natural Gas.* When a reservoir rock containing petroleum charged with dissolved natural gas under high pressure is penetrated by a well, the equilibrium of forces that previously existed is disturbed. If the well is not shut in and flow of fluids to the surface is permitted, the pressure within the reservoir rock in the immediate vicinity of the well is reduced. Reduction in pressure permits release of a part of the dissolved gas from the gas-saturated oil, and the gas, thus released, assumes the form of minute bubbles distributed through the viscous oil mass. The pressure reduction is greatest at and near the walls of the well—."

*"The Ultimate Recovery of Petroleum from its Reservoir Sands:* Within practical limits, the ultimate production will increase as the number of wells increases. Maintaining a certain spacing of wells, the recovery will be increased by drilling them of larger diameter. The rate of development will have an important influence on gross recovery."

It may be that counsel will contend that these publications cannot be considered by this court because they were not introduced in evidence in the trial court. However, this contention is entirely refuted by Judge Brandeis in his dissenting opinion in *New State Ice Co. v. Liebmann*, 285 U. S. 262, 52 S. Ct. 371. See footnotes, pages 282, 283 and 284 of 285 U. S. and pages 376 and 377 of 52 S. Ct.

The respondent has, therefore, taken advantage of the spacing rules of the commission and drilled a reasonable number of wells on its lease. During that period of time it has admittedly recovered 358,000 barrels of oil without depleting the recoverable oil under its lease in any appreciable amount. (Tr. 400, see Exhibit 1, offered Tr. 1 to 20, copied Tr. 674. See also Tr. 311, 312, 621, 397, 399, 456.)

In view of the above facts, it is wholly unnecessary for the court to pass on the validity of the order as applied to the properties of the respondent, because when respondent proved by its own witnesses that it had not been injured through the operation of the statute, it admitted itself out of court. It is a well established principle that a person attacking a state statute, or an order made pursuant to such statute, must show that the alleged unconstitutional features injure him. *Mass. State Grange v. Benton*, 272 U. S. 225, 47 S. Ct. 189, 71 L. Ed. 387; *Cavanaugh v. Looney*, 248 U. S. 453, 39 S. Ct. 142, 63 L. Ed. 354; *Heald v. District of Columbia*, 259 U. S. 114, 42 S. Ct. 434; *Premier-Pabst Sales Co. v. Grosscup, et al*, 298 U. S. 226, 56 S. Ct. 754.

The opinion in the case last cited was written by Mr. Justice Brandeis, and in his usual admirable style, he stated the law as follows:

"We have no occasion to consider the constitutional question, because it appears that the plaintiff is without standing to present it. One who would strike down a state statute as obnoxious to the federal constitution must show that the alleged unconstitutional feature injures him."

## III.

**COURTS CANNOT PERFORM THE ADMINISTRATIVE DUTIES OF THE RAILROAD COMMISSION.**

The learned District Judge stated: "It is, of course, not the duty of the court to write a better order, nor does the obligation rest upon complainant to suggest one." Notwithstanding this statement, the record reflects that the district court did adopt the exact formula submitted by respondent, and in effect held that any order that did not conform to that formula would be void as to the respondent. The Circuit Court of Appeals stated:

"We agree with the district court that in entering an order prorating the amount of oil to be produced from each well the commission should take into consideration the amount of oil in place under the lease as well as other relevant factors and should so administer the order as to allow each lease owner to produce his fair share of the oil from the reservoir. In order to remove any doubt as to the temporary character of the ratio fixed by the district court, the judgment will be amended to read 'without prejudice to the right of the commission to enter a reasonable proration order and to fairly enforce it.'"

The opinion of the district court (Tr. 64) is reported in 28 Fed. Supp. 131, and that of the Circuit Court of Appeals (Tr. 1005) is reported in 107 F. (2) 70.

It will thus be seen that each of the lower courts recognized that its jurisdiction was restricted to a de-

termination of the validity of the order as applied to the respondent and, if found to be invalid, enjoin its operation as against the respondent. However, we think each of the courts erred in holding that the commission, in entering an order, is required to take into consideration the amount of oil in place under the lease, the per acre foot of sand, the sand thickness, etc. We agree that it is proper and helpful to have the court point out the particular infirmities in the order, but we do not believe that it is within its province to direct a particular formula and in effect tell the commission that such formula must be adopted. This is because the commission is an administrative agency of the state, charged with the duty of promulgating and enforcing proper and legal rules and regulations. As to proration orders, the commission holds state-wide meetings practically every month. It has an engineering department and various other employees constantly employed in the various fields, conducting investigations and gathering data and other information to be used in promulgating its orders, rules and regulations, and therefore it should be given liberal discretion in determining the method of proration that it will adopt, using whatever formula it finds appropriate so long as the method adopted will result in giving each owner a fair chance to recover his proportionate part of the oil, provided always that the order shall be written with an eye to the prevention of waste. The paramount purpose of the conservation act is the prevention of waste and conservation of the natural resources. In accomplishing this end, it is, of course, the duty of the commission to prevent, so far as is possible, the impairment of any property rights.

We agree with counsel for the respondent that it is probably not necessary for the court to pass on the question of whether or not an order based on the capacity of the wells to produce is involved in this case, because we cannot sincerely argue that the orders attacked in this action are based on the wells' potentials. It is true that the commission was attempting to prorate on a potential basis, but the top allowable for the field is so low that it clashes with the minimum flat per well allowable.

In his opinion, Judge McMillan, District Judge, stated:-

"As said before, it is not the court's function to draw an order. However, the evidence is not at all clear that this 522,500 barrel top allowable is fixed solely for the prevention of waste. Respondent's engineer Hudnall frankly admitted that he was of the opinion that a higher allowable could be fixed without injury. Their Chief Engineer, Cottingham, did not deny that such was the case. It is manifest from all of the evidence that the allowable has been fixed with an eye to the market as well as with an eye to the prevention of waste. Complainant does not attack the idea of a top allowable. That however does not preclude the court from considering the matter in contemplating the reasonableness of this entire plan of proration."

Here the learned trial judge came dangerously close to uncovering the "nigger" in the wood pile, notwithstanding the fact that neither party was complaining about the top allowable. This demonstrates the vice of the court attempting to suggest a plan of



proration covering a field in which there are many hundreds of producers and operators, some similarly situated, others differently situated, in a single action whereby the rights of one party only are in issue.

Had the court not accepted the suggested plan offered by the respondent, we would have nothing to say about the matter, but since the court has very strongly indicated to the commission that a method of proration that will not *currently* allow each man to recover his percentage of the total reserves will not stand the test, we feel that it is not out of place to invite attention to the infirmities of such a plan. The vast majority of owners of properties lying west of respondent's lease do not have as much oil in place under their lands as does the respondent. A short distance west of respondent's property the sand begins to become thinner and there is a continuous dip from there on to the west side of the field. All of this acreage is underlain with water. The water moves in from the west and rises vertically as the fluid is taken from the reservoir. The pressure is high on the west and low on the east, and the admitted facts are that there is a constant migration from west to east, as well as a constant vertical rise in the water table in the western part of the field, which is underlain with water. This being true, there cannot be any logic to the argument that properties situated in the fairway should be *currently* permitted to produce the same percentage of the recoverable reserves as properties lying west. It is obvious at a glance that a structural correction must be made to offset the migration. If it is not done, it is as plain as the noonday sun that the west side wells will be drowned with water and a

large proportion of the oil beneath the lands will have moved on eastward long before the recoverable oil originally in place under said lands can be recovered. It is obvious that if the respondent is permitted to *currently* recover his percentage of the recoverable reserves, and at the same time have those reserves constantly replaced by oil from the west, in the end, it will recover far more oil than its percentage of the original recoverable reserves. Therefore, if for the sake of argument, we admit that the lower court was correct in holding that if respondent had been permitted to *currently* produce its percentage of the total reserves in the reservoir, it would to date have recovered 200,000 barrels additional oil, still the court's holding is incorrect as a matter of law, because respondent is not now and never has been entitled to produce *currently* the percentage of oil that the recoverable oil under its lease bears to the total reserves of the field. It must be borne in mind that approximately one-half of the field lies west of respondent's lease and the oil is constantly migrating from west to east. Moreover, the allowables are adjusted every month, based on all the factors taken into consideration in making the order. Therefore, under the formula offered by respondent, its recoverable reserves would be estimated every month and the order based on the reserves existing at that time. If such an order had been put into effect when the respondent's lease was first developed, it would have produced until this time, according to the findings of fact of the trial court, 200,000 barrels more oil than it has recovered, or a total of 558,000 barrels, and, according to the testimony, it would still have virtually the same reserves that it had to start with. Of course, this

condition would be brought about by virtue of the orders of the commission not taking into consideration the question of migration.

It is submitted that the lower courts erred in attempting to state the different factors necessary for a valid order, because if the courts are without jurisdiction to write an order, they lack jurisdiction to dictate one.

We are somewhat inclined to the view that if the commission can write an order based on the capacity of the wells to produce, it is required by law to do so, because such an order does not interfere with the operation of either the rule of absolute ownership of oil in place or the rule of capture.

It is elementary law that a police regulation must be so applied as not to destroy or interfere with rules of property if its objective can be obtained without doing so.

For instance, if the commission finds that it is necessary to curtail the production of a pool 50%, if each well in the pool were curtailed 50% of its capacity to produce, neither of the above mentioned property rules would be destroyed.

The common law rule would merely be modified to the extent that the police regulation operated to curtail the production, but each owner would receive the same treatment.

It will be contended that this method is impracticable. It is if the top allowable for the field is not raised, but we are inclined to agree with the opinion of Judge McMillan that, even though the point were

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not in issue, it is not clear from the evidence that a higher allowable could not be fixed without injury. At any rate this issue should not be foreclosed merely because the commission and one litigant agree on it, when it affects hundreds of other owners and operators in the East Texas Field.

#### IV.

#### THE MARGINAL WELL LAW AND ITS EFFECT ON PRORATION.

What is known as the marginal well law, Article 6049b, Texas Revised Civil Statutes, and made Appendix "A" to this brief, insofar as it applies to the East Texas field, provides as follows:

"(b) Any pumping oil well within this State having a daily capacity for production of twenty (20) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a horizon deeper than two thousand (2,000) feet and less in depth than four thousand (4,000) feet."

It will be noted that the wells are classified according to depth. A pumping well 2,000 feet deep or less, having a daily capacity of 10 barrels or less, is a marginal well. A pumping well deeper than 2,000 feet and less than 4,000 feet, having a daily capacity of 20 barrels or less, is classified as a marginal well. A pumping well producing from a horizon 4,000 feet deep and less than 6,000 feet deep, having a daily capacity of 25 barrels, is a marginal well. A pumping well 6,000 feet deep and less than 8,000 feet deep, having a daily capacity of 30 barrels or less, is a mar-

ginal well. A pumping well producing from a horizon deeper than 8,000 feet, having a daily capacity of 35 barrels or less, is a marginal well.

The marginal well law is not in issue in this case except indirectly, but the rights of persons owning wells that are better than marginal wells, and which the trial court found could be operated profitably on from 5 to 10 barrels per day, are vitally concerned, because under the plan proposed by the respondent and accepted by the lower courts, these wells, and there is a great number of them, will have their allowables curtailed below the marginal well allowable. It is no answer to this proposition that there are only 471 marginal wells in the field. As a matter of fact, the marginal wells are daily increasing and they are not located in any particular place except, of course, as the word "marginal" indicates, as a general rule they are edge wells. However, there are many wells immediately adjacent to the marginal wells that are pumping wells and are producing from a few barrels more to several times what the marginal wells will produce. These wells in many instances are direct offsets to marginal wells, and from past experience, it will be quite a while before some of them will become marginal wells. The marginal wells are not so located as to set them out in a class to themselves, so that their operation will not affect the other wells in the field. The learned trial court held that 471 marginal wells were too insignificant to control the plan of proration. The trouble is that several times that number of pumping wells will, under the formula suggested, be vitally affected and they are better wells than the marginal wells, in that, on the east side the



marginal wells will continuously drain oil from the better wells, and on the west side, and the north and south ends, such wells will be so unreasonably curtailed that some of them will be drowned by water within a short time, and others abandoned due to burdensome operating cost. This condition will be aggravated as time passes.

In view of the status of oil and gas under the common law, the power of the legislature to enact the marginal well law, we believe, is beyond doubt. The fact that marginal wells are classified according to depth clearly indicates the limit to which it was intended that the citizen should be deprived of his property, or its use, in the enforcement of the conservation law, and that more drastic curtailment transcended public necessity.

We submit that the commission is charged with the duty of maintaining a minimum allowable of 20 barrels per day and whatever formula is adopted must be in obedience to this mandate.

We have just received brief from the attorneys for the respondent, Rowan & Nichols Oil Company, and have only a few remarks to make with reference to it. On page 3 of the brief we find this statement:

"The findings of fact were based on testimony which is practically undisputed on material points. Although Petitioners did not except to the findings of fact or request that they be modified or that additional findings be made, and, as Respondent understands, do not here question the sufficiency of the evidence to support the findings, they argue the suit from the testimony and not from the findings."



Rule 46 of the Federal Rules of Civil Procedure reads as follows:


"Rule 46. Exceptions Unnecessary. Formal exceptions to rulings or orders of the court are unnecessary; but for all purposes for which an exception has heretofore been necessary it is sufficient that a party, at the time the ruling or order of the court is made or sought, makes known to the court the action which he desires the court to take or his objection to the action of the court and his grounds therefor; and, if a party has no opportunity to object to a ruling or order at the time it is made, the absence of an objection does not thereafter prejudice him."

Respectfully submitted,

J. N. SAYE,

W. T. SAYE,

*Attorneys for Amici Curiae.*



## APPENDIX "A"

Art. 6049b. Marginal wells defined; curtailing production.

Sec. 1. The term "Marginal Well" as used herein means a pumping oil well capable, under normal unrestricted operating conditions, of producing such daily quantities of oil as herein set out as would be damaged, or result in a loss of production ultimately recoverable, or cause the premature abandonment of same, if its daily production were artificially curtailed. The following described wells shall be deemed "Marginal Wells" in this State:

(a) Any pumping oil well within this State having a daily capacity for production of ten (10) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a depth of two thousand (2,000) feet or less:

(b) Any pumping oil well within this State having a daily capacity for production of twenty (20) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a horizon deeper than two thousand (2,000) feet and less in depth than four thousand (4,000) feet:

(c) Any pumping oil well within this State having a daily capacity for production of twenty-five (25) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a horizon deeper than four thousand (4,000) feet and less in depth than six thousand (6,000) feet:

(d) Any pumping oil well within this State having a daily capacity for production of thirty (30)

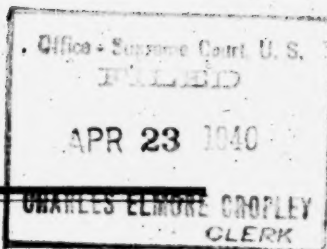
barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a horizon deeper than six thousand (6,000) feet and less in depth than eight thousand (8,000) feet:

(e) Any pumping oil well within this State having a daily capacity for production of thirty-five (35) barrels or less, averaged over the preceding thirty (30) consecutive days, producing from a horizon deeper than eight thousand (8,000) feet. (As amended Acts 1933, 43rd Leg., p. 215, ch. 97.)

Sec. 2. To artificially curtail the production of any "Marginal Well" below the marginal limit as set out above prior to its ultimate plugging and abandonment is hereby declared to be waste, and no rule or order of the Railroad Commission of Texas, or other constituted legal authority, shall be entered requiring restriction of the production of any "Marginal Well" as herein defined. (Acts 1931, 42nd Leg., p. 92, ch. 58.)

FILE COPY

No. 681.



IN THE  
**Supreme Court of the United States**

OCTOBER TERM, 1939.

\_\_\_\_\_  
No. 681.  
\_\_\_\_\_

RAILROAD COMMISSION OF TEXAS, ET AL., *Petitioners,*

v.

ROWAN AND NICHOLS OIL COMPANY, *Respondent.*

\_\_\_\_\_  
On Writ of Certiorari in the United States Circuit Court  
of Appeals for the Fifth Circuit.

\_\_\_\_\_  
**BRIEF AMICUS.**

\_\_\_\_\_  
{ NORMAN L. MEYERS,  
Washington Buikling,  
Washington, D. C.,  
*Amicus Curiae.*

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**OPINIONS BELOW.**

The opinion of the District Court (R. 64) is reported in 28 F. Supp. 131. The opinion of the Circuit Court of Appeals (R. 1005) is reported in 107 F. (2d) 70.

**JURISDICTION.**

The judgment of the Circuit Court of Appeals was entered on November 3, 1939 (R. 1010). The petition for the writ of certiorari was filed in this Court on January 29,

1940, and the petition was granted by this Court on March 11, 1940. The jurisdiction of this Court is invoked under section 240 of the Judicial Code as amended by the Act of February 13, 1925 (U. S. C., title 28, section 347).

### STATEMENT.

An injunction granted to the Respondent was affirmed by the Circuit Court of Appeals giving relief to the Respondent from a proration order of the Railroad Commission of Texas on the ground that the order deprived Respondent of its property without due process of law in violation of the 14th Amendment to the Constitution of the United States in that it denied the Respondent an "equal opportunity with other owners in the East Texas field to recover that portion of the oil to which it is entitled" (R. 10). This Brief is filed on behalf of "other owners of the oil" who allege that they are being irreparably injured by the injunction affirmed by the Circuit Court of Appeals and here for review, and further that should the basis for proration laid down by the courts below be allowed to stand that they, rather than Respondent, properly can claim that *they* would be deprived of "equal opportunity" under proration.

The order of the Railroad Commission, it is alleged by Petitioners, is necessary for the conservation of oil and gas, is in conformity with the conservation laws of Texas, and that under it the Respondent was receiving and would receive in the future its fair share of the recoverable oil in the East Texas field (R. 48). The proration order of the Commission embodies no logical formula which would equitably distribute oil in a vacuum but is designed to meet the specific physical characteristics of this particular field and the wells producing in it under spacing rules complementary to the proration orders in achieving conservation. To comprehend fully the issues in this case, it is essential to consider the basic proration order within the framework of the proration system as it operates in the East Texas field.

## I. The Physical Character of the East Texas Field.

**Size and shape.** The East Texas field, the largest discovered field in the world, is about forty miles in length from north to south, has an average width of about four miles, and has a surface acreage of approximately 133,000 acres. The field has a common reservoir located about 3,600 feet below the surface (R. 556). It is part of the eastern extremity of the Woodbine formation which was an early geological shoreline. In cross-section from east to west the field is roughly triangular in shape with the top and long side tilting upward to the east (R. 353). The top side and the lower eastern side of the triangle which begins in about the center of the field are formed by impervious rock formations which entrap the oil within the porous interstices in the reservoir sand. The lower western side of the triangle consists of an oil-water face where the water column in the interstices of the Woodbine sand extending from an outcrop at the surface, approximately a hundred and fifty miles to the west, dips down and presses upon the oil accumulation. The oil producing sand is approximately 100 feet thick through the center of the field, diminishing to nothing both on the east where it pinches out and on the west where its porous spaces are filled with water instead of oil (R. 102).

**Water-drive field.** The East Texas field is predominantly a water-drive field, the pressure of the water furnishing the chief reservoir energy of the field (R. 361). All of the natural gas in this field is found in solution with the oil. The water-drive pressure fulfills, therefore, two vital functions. The pressure upon the oil exerted by the water in the general reservoir (the reservoir energy) propels the oil through the individual wells (R. 604). As long as this is maintained above a minimum level, a well pressure at the bore of the wells will maintain an efficient flush flow. Secondly, the pressure, as long as it is maintained above the minimum, will keep the gas in solution and thereby greatly



decreases the viscosity and increases the fluidity of the oil. At the time of discovery, the bottom hole pressure was about 1,625 pounds per square inch (R. 354). At the commencement of the trial of this case the average bottom hole pressure had dropped only to 1,106 pounds (R. 358).<sup>\*</sup> During this period there has been a gradual rise in the water level of about 10 feet from an average of approximately 3,320 feet below sea level.

**Permeability.** The East Texas field exhibits a high degree of permeability of the sand and the pressure is fairly uniformly distributed through large areas of the field. However, as the reservoir sand pinches out to the east the sand is much tighter and less permeable. The reservoir sand is interspersed with occasional strata or leases of impermeable shale and volcanic ash, particularly in the southern part of the field toward the eastern edge (R. 424). In such areas pressures are not as readily transmitted.

**Pressure maintenance.** At the time of discovery the pressure was practically uniformly distributed through the field. With the drilling of wells, pressure differentials are created propelling the oil to the surface, the pressure moving water in to displace the oil as it is produced (R. 355). Pressure gradients are thus set up from west to east, with the high pressure at the west graduating down. In the southern, less permeable sections of the field, the pressure can not be transmitted as readily as in the north end of the field (R. 365). For each well to recover the oil in place in the area which it would normally drain it would be necessary to shut in all but the western wells which would produce the oil in place until the rising water completely displaced the oil. Then by progressive retreats eastward in front of the advancing water each line of wells would recover its oil in place. However, the delay to producers in the east has not

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<sup>\*</sup>The average pressure for the field is determined monthly by the Railroad Commission by taking pressure gauges on ninety-one key wells (R. 357).

been found equitable or necessary. Production schedules can be so arranged so that each well gets the oil in place or its equivalent, drainage to wells compensating for drainage away. Within specific areas where wells are produced at a rate to maintain equalized bottom hole pressures, there is a minimum of drainage as between wells. If one well produces at a much greater rate than its off-set, pressure gradients to it will cause drainage from the off-set.

In the early days of unrestricted production the drop in pressure was great. In not quite two and one-half years, from discovery to June, 1933, during which estimated production was only 319,996,000 barrels, the drop in average pressure totalled 385 pounds or 1.2 pounds per million barrels produced. Under more or less effective proration from June, 1933, to December, 1938, roughly five and one-half years, in which 906,760,000 barrels were produced, the drop was only 133.22 pounds or .147 pounds per million barrels (R. 356). In recent months, as proration has become more and more effective, by carefully limiting the total withdrawals from the field pressure has been well maintained. In the fifteen months preceding the trial of this case, the pressure drop per million barrels was only .062 pounds (R. 358).

For the whole period approximately 1,304,703,000 barrels of oil had been produced from the East Texas field. While estimates of the recoverable reserves differ, Respondent's engineers place the recoverable reserves still remaining in the field at about 2,217,000,000 barrels (R. 675). This large recovery is predicated upon the maintenance of the pressure through curtailed ratable takings by the wells in the field.

**Abandonments.** Because of the physical character of the fields as outlined above, the wells piercing the productive sands on the western and on the eastern side of this triangular reservoir are comparatively short lived. As the field has been produced, the western edge wells have gone to water with the rise in the water level.

Where production from the western wells has not produced all the oil in place before water penetration, the drive of the advancing water has forced a migration of the oil eastward, draining the western part to replenish the middle of the field as oil has been withdrawn from it. Insofar as production practices have not maintained a proper control to prevent irregular water encroachment, oil otherwise recoverable has been lost.

The relatively short life of the eastern wells is due primarily to the pressure drop in the field. As the pressure in the field has dropped wells on the eastern edge of the field have gone dead.

Thus far, about two-thirds of the abandonment of wells has occurred on the western side of the field due to water encroachment and one-third on the east side due to the drop in pressure as a result of the production throughout the field. (R. 363, 541, 582).

**-The Fairway.** The central area extending through the field is known as the Fairway with the axis running north and south. The Fairway has the greatest sand thickness, the thickest sand being about 100 feet thick. It has the longest life expectancy and stands to benefit by the gradual abandonment of outlying wells (R. 457). As the total number of wells decreases due to a shrinking of the producing area (R. 527), the more fortunately situated wells still enjoy the full benefit of the reservoir energy since the total optimum withdrawal from the field will be made through wells in a steadily shrinking area; over a period of time wells in this area will receive a markedly increased daily allowable over their prolonged life due to proration (R. 393, 456, 514, 527, 571). These wells likewise benefit from such drainage from the west as may take place because of the water encroachment (R. 462).

## II. The Proration System in East Texas.

The conservation laws administered by the Railroad Commission are designed to prevent wasteful production from the field as a whole, while, at the same time, protecting the correlative rights of each producer in the field to his aliquot share. Basically production is controlled by (1) drilling and spacing regulations which limit the *number* of wells and their location and (2) by proration orders regulating the *total withdrawals* of oil from the field as a whole and allocating *allowables* (or production quotas) to the wells. The equity of the proration orders can not be judged without taking into account the development of the field under the spacing rules.

**Number and spacing of wells.** In accord with its Rule 37, the Railroad Commission established a ten-acre spacing program for East Texas; that is, it permitted one well to ten acres. However, Rule 37 provides that additional wells might be drilled as exceptions to the ten-acre spacing where such exception are necessary either to prevent waste or to prevent confiscation of property. Where peculiar physical conditions are shown, an exception is granted to permit additional wells. Where the owner of a small tract of less than ten acres or of irregular shape can show he can not recover his oil without an exception to the Rule, the Commission makes a practical adjustment in behalf of the property rights of the surface owner by granting permits to drill as exceptions to the general rule (R. 896).

As the East Texas field has been developed there has been a great number of "exceptions" granted either by the Commission upon application or by Court injunction overruling Commission denials. At the time of trial of this case there were approximately 25,910 wells drilled in the field (R. 221), and the average density of drilling was one well to 5.133 acres (R. 149).

**The Proration Order at Issue.** The Order of the Commission invalidated by the Court below in this case was promul-

gated on August 29, 1938, (R. 666) and is similar to Orders in effect since the proration order was upheld in *Amazon Petroleum Corp. v. Railroad Commission*, 5 F. Supp. 633 in February, 1934.\* The Order of August 29, 1938, set the total daily allowable for the East Texas field at 522,500 barrels of oil.

A formula was then adopted which distributed allowables among the wells in the field as follows.\*\* All wells incapable of producing more than twenty barrels a day were allowed to produce to capacity in accord with the Marginal Well Law.\*\*\* Then all wells in the field were granted a minimum allowable of twenty barrels; thus no good, flowing well was curtailed below the minimum established by law to protect the marginal wells.\*\*\*\* The balance of the field allowable after deducting the total allowable thus determined was allocated to the more productive wells by multiplying the factor of 2.32 per cent\*\*\*\*\* to the hourly potential of the wells, so that those wells whose hourly potential multiplied by 2.23 per cent totalled more than 20 barrels per day received an hourly allowable graduated up from 20 barrels daily to about 26 barrels daily.

The full consequence of this formula can be seen only by observing the proration order *in operation*, especially in its effect upon the Respondent's property.

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\*It was stipulated that this case is to cover subsequent similar orders (R. 667). The Railroad Commission, in the light of evidence introduced in its Hearing, subsequently materially changed and improved its proration formula but specifically allocated allowables to Respondent in accord with the decree below, pending decision by this Court.

\*\*The method of proration is described in detail in a stipulation (R. 995).

\*\*\*Texas Revised Civil Statutes, 1925, Art. 6049b.

\*\*\*\*The effect upon wells more densely spaced than the average is considered hereinafter.

\*\*\*\*\*This factor was empirically determined to produce the necessary degree of curtailment.

### III. The Position of Respondent's Lease.

**Located in the Fairway.** The property of the Respondent in this action is in the "Todd 'B' lease" of 24.99 acres situated in the northern half of the field. Located in the Fairway, its lease is located where the sand is thickest and most permeable (R. 109, 459, 460, 462).

**Drilled under exceptions above average density.** The Respondent has drilled five wells on this lease. All five of the wells were drilled as exceptions to Rule 37 (142-144). Two were drilled in 1931, two in 1933, and one in 1934 (R. 674-675). Each time a permit under exception to Rule 37 was obtained by the Respondent, this lease was as densely drilled or more densely drilled than the field as a whole and also of the surrounding tracts. Respondent conceded that the drilling of the wells in each case gave it a considerable density advantage over the field and also even over adjoining tracts (R. 142-152).

Respondent's lease is, and has been since 1934, drilled to a density of one well to 4.99 acres. Meanwhile, despite thousands of wells drilled in exception since 1934, the field now is drilled only to an average of one well to 5.133 acres. Furthermore, should the sixth well, for which a permit has been granted Respondent (*infra*, p. 15), its lease would be drilled to a density of one well to 4.16 acres.

**Advantageous drainage to Lease.** This lease had already produced over 355,000 barrels of oil up to the commencement of the trial in this case (R. 109, 191). Because of the density of wells and the production obtained during the time in which proration was established and developed, the oil produced has been replaced by oil drained from the west, north and south of Respondent's lease (R. 395, 398, 616). Despite the great production record, *the Respondent's lease still has in place beneath it substantially the same amount of oil as was originally in place beneath the lease* (R. 456). Although it claims it is damaged by drain-



age from its lease (*infra*, p. 13), Respondent is compelled to admit that through drainage to its lease under past and present proration orders it has made a net gain by drainage of an amount substantially equal to the amount of oil which has been produced from its lease (R. 621, 311).

#### **IV. The Present Proration Order in Operation in the East Texas Field.**

The productivity of a well is dependent upon many factors which a proration order must take into account, notably the area which a well drains, the sand thickness, the porosity and permeability of that sand, and the *bottom hole pressure* (R. 426). The total pressure of the field as applied to the bore of a well constitutes the bottom hole pressure for that well; the maintenance of the pressure, and thus in large measure the ultimate productivity of both a well and the entire field is dependent upon the control of production through *all* the wells in the field. Further, whether the oil reserve tapped by a given well will be recovered by that well is dependent upon whether it is recovered *in time* before water encroachment due to the production of *all wells* drains out a given well, be it on the western side of this field, or before the dissipation of the reservoir energy by the action of *all* the wells causes such a pressure drop as to make a given well, be it on the eastern side, unproductive even by pumping.

As has been pointed out (*supra*, p. 5) the limitation of total daily production in the field has reduced the average pressure drop to almost a nominal amount. The maintenance of this pressure relatively through the field by proper distribution of allowables prevents any abnormal pressure gradients to set up any undue migration of oil as between areas. Maintenance of relative pressure is a two-fold prevention problem: the prevention of any major trend of migration as between areas in a field, and the prevention of drainage as between wells more or less densely located in a given area.

A proration order must also take into account the allowance of sufficient production to a well on a small tract so as not to constitute a confiscation of the property.

The proration order challenged in this case is bottomed on these principles as applied to the physical character of the East Texas field, sufficient weight being given each factor to due equity as between conflicting interests.

**A. The minimum allowable to each well.** The order gives a minimum allowable of 20 barrels to each well. Thus no well is restricted below the minimum set by statute for marginal wells. This allowable at one and the same time assures sufficient production so as not to constitute confiscation of any small property and gives recognition to the surface area as a proration factor since wells are spaced on the average of one well to each 5.13 acres. Both the sand areas on the west and on the east have densely drilled areas (R. 677). Because of the peculiar physical character of this field, this minimum allowable per well also constitutes a temporary weighted factor for the western and eastern wells assuring them of sufficient opportunity to utilize the reservoir energy common to the field as a whole to recover the oil in place or its equivalent in the areas which they drain before the water encroaches or the pressure drops forcing them out of production (*Supra*, p. 6).

**B. Additional allowable based on hourly potential.** To the minimum allowable is added an additional allowable based on the hourly potential of each well: the hourly potential is an index of the bottom hole pressure, porosity, permeability, connate water, structural position, and in fair measure of sand thickness (R. 426, 529, 325). Thus the alleged failure to give weight to reservoir content is more apparent than real. The formula for proration gives varying weight, determined by the specific data for this field, to area by thickness by physical character of the cubical content. This is especially true as it operates over a period of time.

**C. The tempo of production as affecting relative allowables.** The optimum total allowable for the field (approximately 522,000 barrels as established by this Record R. 666), divided by the extraordinarily great number of wells presently in operation (25,910 at beginning of trial, R. 221) makes the range of allowables as between near marginal wells and wells of great potential capacity very narrow. At first blush this appears inequitable. But this proration formula is predicated upon the established fact that the total of wells for each proration period will progressively shrink due to abandonments as the oil in place is recovered by wells on the periphery of the field (*supra*, p. 6). Consequently, there will be a progressively increasing portion of the total allowable to be apportioned by the factor of hourly potential. Over the flush life of the field therefore the weight accorded the different factors will continuously vary because of the physical nature of the field. Wells in the Fairway where the sand is thickest and where life will be longest will have gradually increasing allowables, meanwhile giving time to other wells to recover their oil in accord with good conservation practice and during that process, conserving the reservoir energy to extend greatly the life of the Fairway wells themselves.

**D. Prevention of undue drainage.** The relatively sharp curtailment at present of the Fairway wells prevents the creation of unnecessary pressure gradients causing rapid drainage to the wells of greatest production. This proration schedule thus permits production of oil in place before migration would deprive a well of the oil in the area which it is capable of draining. Thus the mal-effects of the Rule of Capture are neutralized not only for the field as a whole but for the producers within the field variously situated.

## V. The Objections to the Order in Operation by the Respondent.

The objections to the proration order in operation raised by the Respondent can be properly appraised only after considering the concessions of validity made by the Respondent.

### A. Concessions of validity. The Respondent conceded

(1) the validity of the statute authorizing the Commission to regulate production "in a reasonable manner" (R. 13),

(2) the validity of the total field allowable of early production (R. 130, 601),

(3) the validity of the spacing regulations including provisions for exceptions to the established spacing pattern (R. 4, 21),

(4) the legality of all the wells drilled under such regulations (R. 4),

(5) the necessity of setting some minimum allowable per well (R. 328, 633, 638),

(6) the basic doctrine of ownership of oil in place.

**B. Objection on ground allowable should be set solely on basis of ratio between current reserves of its lease to current reserves of field.** Despite having conceded that the valid total allowable for the field must be equitably divided among all the wells in the field with some minimum daily allowable per well (determinable in the discretion of the Railroad Commission after due hearings) to the end that producers may recover oil in place beneath their lands, Respondent prayed that allowables be periodically set solely in accordance with the ratio that its *current* estimated oil reserves bear to the *current* total estimated reserves for the field (R. 7, 10, 67). Recognizing that proration under such a formula would cause material drainage to its lease, Respondent relies upon a strained interpretation of the con-

cept of "oil in place" to make it include "migratory oil" coming to its lease because of "natural" advantages (R. 308, *infra*, p. 25).

**C. Objection on ground the Commission's Order would deprive Respondent of its oil in place.** Respondent contends that at the present rate of total field production (522,000 barrels) and at the rate of production of its lease under the present allowable (111.83 barrels) it could not produce its oil in place before the field was exhausted, thus being deprived of its property without due process of law (R. 675).

This calculation ignores the fact that its wells will get a progressively larger allowable which will constitute an increasing proportion of the whole. See *infra*, p. 31.

**D. Objection on ground that the delayed production due to the tempo of the proration formula is confiscatory.** Protest is made that curtailment over a period of time to permit others having correlative rights is tantamount to present day confiscation.

Objection to curtailment to achieve conservation with protection of correlative rights is contrary to well established law. See *infra*, p. 33.

**E. Objection on ground that wells on small tracts get disproportionate allowable and deny to Respondent an equal opportunity to the production of a fair share of the oil.** The Respondent protests that while its wells, drilled on the average of about one well to five acres of the most productive area are limited to only twenty-two and a fraction barrels per day per well (R. 99), other wells on small tracts, chiefly in the comparatively short-lived area, and capable of only making the minimum are producing twenty barrels per day, making a great differential on a surface acreage basis (R. 118, 677).

Insofar as Respondent may be injured by drainage to wells on certain small tracts it is the result of the administration of the spacing rules and not of the proration orders for the field as a whole. See *infra*, p. 38.

## **VI. Attempted Relief Through Administrative Remedies.**

Prior to the filing of this suit, the Respondent filed with the Railroad Commission an application for an increase in the allowable on its Todd "B" lease and on the alternative for permits under exception to Rule 37 to drill twenty additional wells. A hearing was held and a permit was granted for a sixth well (Exhibit 14, offered R. 348, copied R. 881). No action was taken on the application for an increase in the lease allowable. The sixth well has not as yet been drilled (R. 612). Upon petition for rehearing in re- to the increase in allowable, further hearings were he. by the Railroad Commission (R. 883, Exhibit 4, R. 718). This action was instituted before any further action was taken by the Railroad Commission.

## **VII. Respondent's Case as Sustained by Courts Below.**

Having been among the leaders in the drive for dense drilling under permits as exceptions to Rule 37—and having benefitted accordingly—now that the well density in the field is approaching that of Respondent's lease, Respondent has now sued for injunctive relief asking for a new basis for proration. It contends now that it should be permitted to produce from its lease a daily allowable which bears to the total field allowable the same ratio that the *current* "estimated" recoverable oil under Respondent's lease bears to the *current* total "estimated" recoverable oil in the East Texas field.

The District Court finding for the Respondent (R. 64) entered its order (R. 76) enjoining the enforcement of the proration orders of the Railroad Commission as applied to Respondent's property. The Court accepted the Respondent's theory and also one set of estimates and calculations



showing that its lease should have an allowable of 220 barrels when the field allowable is 522,000 barrels (R. 132). In its judgment, the Court substituted a method of proration to be followed whereby the allowable for the Todd "B" lease hereafter is to be set for the Todd "B" lease at "that amount of oil which bears to the daily field allowable fixed by the Railroad Commission the ratio which 220 barrels bears to 522,000 barrels" (R. 78). The Circuit Court of Appeals accepted a second set of estimates (R. 1009) and affirmed the order of the District Court. Although it approved the setting of the lease allowable by the ratio method, nevertheless it ambiguously stated that a proration order "should take into consideration the amount of oil in place under the lease *as well as other relevant factors* and should so administer the order as to allow each lease owner to produce his fair share of the oil from the common reservoir" (R. 1011). In order to permit some change in the "temporary character of the ratio", the judgment was amended to read "without prejudice to the right of the Commission to enter a reasonable proration order and to fairly enforce it" (R. 1010).

The legal principle is thus laid down that proration must be based solely upon the ratio of estimated reserves in a lease to the estimated reserves for an entire field, *denying any weight to time element, minimum allowable, productivity of specific areas, or any other factor designed to assure an ultimate recovery over the life of the field of the oil in place by all producers in all portions of the field who are differently affected by the moving ratio between current estimates of lease and field recoverable oil due to drainage set up by this method of proration.*

## **SPECIFICATION OF ERRORS.**

In this brief amicus the following specification of errors are considered:

(1) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary and confiscatory of the property of the Respondent, and deprive it of its property without due process of law in violation of the 14th Amendment of the Constitution of the United States.

(2) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary, and confiscatory, such orders being designed to provide a producing schedule whereby each producer may obtain substantially the equivalent of the oil in place beneath his land and an equitable share in the natural reservoir energy of the entire field, because such a schedule provides varying tempos for production which temporarily disproportionately curtail highly productive wells to enable lesser wells to produce their oil before such wells are drowned out by water or their oil is drained away.

(3) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary and confiscatory in that a minimum allowable per well is set for all wells at not less than 20 barrels.

(4) In holding that the proration orders of the Railroad Commission are unreasonable, arbitrary and confiscatory in so far as they allocate the allowable production of oil on the basis of the potential producing capacity of each well in the field.

(5) In holding that the Railroad Commission must establish proration in the East Texas field so as to allocate to the Respondent's lease a daily allowable production which bears to the total daily allowable for the field the same ratio that the estimated recoverable oil beneath such lease bears to the estimated recoverable oil in the entire field to the exclusion of all other relevant physical and engineering factors.

## SUMMARY OF ARGUMENT.

Under established tenets of administrative law, the District Court should not have substituted its principle of proration for that in the order of the Railroad Commission. The Commission in the exercise of its best expert judgment promulgated the order in issue as the most equitable in the light of the evidence before it. The Record demonstrates the inequity of the principle enumerated by the District Court and shows substantial evidence in support of the Commission's order.

(1) Under Texas law, a landowner owns the oil in place beneath his land and under proration is only entitled to recover the oil in place or its equivalent. The proration formula advocated by the Respondent and accepted by the courts below denies to some producing areas a right to the oil in place or its equivalent and adds to producing areas, such as that of Respondent's, migratory oil drained to it. To do so, it distorts the doctrine of oil in place, and is confiscatory of oil producible by wells competing with those of Respondent.

(2) The proration order struck down by the courts below is not unreasonable, arbitrary or confiscatory of the property of the Respondent. The present order has evolved out of long experience and is based not on conjectural estimates but on ascertained measurable factors. The Respondent has shown no basis for it to attack the reasonableness of the order. It is not presently injured nor has any of its oil thus far been confiscated. The order does not and will not confiscate the oil in place or its equivalent beneath Respondent's lease. It does deny the Respondent's claim to "migratory oil". The Respondent is not deprived of its property without due process because of any delay in production, nor can it now complain because wells on small tracts are presently getting a relatively high allowable. The proration order based on a minimum allowable per well

plus an addition according to a weighted factor is not *per se* invalid.

### ARGUMENT.

The legislature of Texas designated the Railroad Commission as the administrative agency to whose informed judgment and discretion it has submitted the determination of fact as to the physical problems inherent in proration in a specific field and the reasonableness of a method of proration on the basis of which it is authorized to make its administrative orders. Texas Revised Civil Statutes, 1925, Article 6049c.

The order at issue in this case has evolved out of a long and litigious experience by the Commission. *MacMillan v. Railroad Commission*, 51 F. (2d) 400; *Danciger Oil and Refining Company v. Railroad Commission*, 49 S. W. (2d) 837; *Constantin v. Smith*, 57 F. (2d) 227; *Peoples Petroleum Producers v. Smith*, 4 F. Supp. 361; *Peoples Petroleum Producers v. Sterling*, 60 F. (2d) 1041; *Sterling v. Constantin*, 53 S. Ct. 190; *Amazon Petroleum Corporation v. Railroad Commission*, 5 F. Supp. 633.

Absolute equity at all times and in all things is impossible because of the engineering problems involved. The Commission in the exercise of its best expert judgment promulgated the present order as the most equitable solution it can find on the basis of current knowledge. The District Court overturned the order and substituted its own principle for proration.

This action by the District Court was not in accord with the well established tenets of administrative law. The validity of an order for the East Texas field must be determined by the special circumstances in this field. The Record amply discloses through the testimony of the Commission's expert staff members the basis of the Commission's order. As long as there is substantial evidence the judgment of the expert body must stand. Even though a court upon the consideration of the evidence might reach a different conclusion, it can not substitute its own order for the

administrative order if there is a rational basis for the order adopted by the Commission. *Cf. Rochester Tel. Corp. v. U. S.*, 307 U. S. 125; *Swayne v. Hoyt*, *Id.*, U. S., 300 U. S. 297; *Mississippi Valley Barge Line Co. v. U. S.*, 292 U. S. 282. The record in this case both demonstrates the inequity of the principle adopted by the Court and the rational basis for the expert judgment of the Commission.

## I.

### **A Landowner Owns the Oil in Place Beneath His Land and Under Proration is Only Entitled to Recover the Oil in Place or Its Equivalent.**

Both the method of proration advocated by the Respondent and the method struck down rest upon the identical statement of the basic property law of oil and gas. However, the Respondent, while doing lip service to the wording of the law, would import into it a meaning contrary to its accepted sense and contradictory of the plain meaning of the words themselves.

It is uncontested that under the common law of Texas the Respondent is the owner of the oil in place\* under its Todd "B" lease and is entitled to produce only its oil in place or its equivalent. *Stephens County v. Mid-Kansas Oil & Gas Co.*, 113 Tex. 160; *Texas Co. v. Daugherty*, 107 Tex. 226; *Lemar v. Garner*, 121 Texas 502, 50 S. W. (2d) 769; *Humphreys-Meria Co. v. Gammon*, 113 Texas 247, 254 S. W. 296; *Thuss, Texas Oil and Gas* (2d ed.), p. 16; 1 *Summers, Oil and Gas* (2d ed.), sec. 62, p. 124; *Hardwicke, on Texas in "History of Conservation of Oil and Gas, A Symposium,"* (American Bar Assoc., Mineral Section), pp. 238-243.

Prior to the conservation laws, the means of producing the oil in place was governed by the common law Rule of Capture. From the earliest cases in which the Rule of Capture was embodied, the Courts have recognized the cor-

\*Where gas is found with the oil the principle is, of course, applicable to the gas as well.

relative rights of owners of a pool. Under the then limited knowledge of the geologic facts concerning oil accumulation and production, the courts held that ratable taking from a common reservoir of oil was to be achieved by permitting each producer to produce whatever he could from his own wells, drilled as he deemed fit. Other producers protected their correlative rights by drilling off-set wells and producing headlong to prevent drainage by their neighbors. Thus the ability of one to capture was limited by the ability of all others simultaneously to capture. It was an attempt to establish a self-operating principle which would accord each producer his fair share of oil in a pool. *Prairie Oil and Gas Co. v. State of Texas*, 231 S. W. 1085; *Stephens County v. Mid-Kansas Oil & Gas Co.*, 113 Tex. 160; *Houston & T. C. Ry. Co. v. East*, 98 Texas 146, 81 S. W. 279; *Texas Co. v. Daugherty*, 107 Tex. 226; *Waggoner Estate v. Sigler Oil Co.*, 118 Tex. 509, 19 S. W. (2d) 27; *Marshall and Meyers*, "Legal Planning of Petroleum Production," 41 Yale Law Journal, 33 (1931); *Hardwicke*, "Rule of Capture and Its Implications as Applied to Oil and Gas," 13 Tex. Law Rev. 401.

With the adoption of conservation laws a new and more equitable rule of law was created to govern the taking of oil so as to assure each producer a fair chance to recover the oil in place, or its equivalent. Instead of uncontrolled drilling, wells are located according to spacing rules; instead of unrestricted, wasteful operation, production is curtailed. The conservation laws have the dual function of (1) eliminating waste, and of (2) protecting the correlative rights of all producers in the field. *Ohio Oil Co. v. Indiana*, 177 U. S. 190, 20 S. Ct. 576; *Walls v. Midland Carbon Co.*, 254 U. S. 300, 41 S. Ct. 118; *Bandini Petroleum Co. v. Superior Court*, 284 U. S. 8, 52 S. Ct. 103; *Champlin Refining Co. v. Corporation Commission*, 286 U. S. 210, 52 S. Ct. 559.

Both in its spacing regulations limiting the number of wells for each producer and in its proration schedules lim-



iting the production for each well the Railroad Commission must preserve the correlative rights of each producer in his claim to the oil in place beneath his lease.\*

Equidistant well spacing with exceptions in order to prevent waste (R. 677, 164) or in order to prevent the confiscation of oil in place beneath a small or irregular shaped tract (R. 955) is well established. *Hardwicke, Rule of Capture and its Implications as Applied to Oil and Gas*, 13 Tex. Law Rev. 119, 391 (1934); *Walker, The Problem of the Small Tract Under Spacing Regulations*, 17 Texas Law Review, 157 (1938). The proper test of the reasonableness of such regulation is whether a producer is given

"an equal opportunity with adjoining leaseholders of developing and realizing for his leasehold."

*Railroad Commission v. Bass*, 105 W. (2d) 586, 588, Ct. *Orford Oil Co. v. Atlantic Oil and Oil Producing Co.*, 16 F. (2d) 639, 22 F. (2d) 597, cert. denied, 277 U. S. 586.

In a leading case on well spacing, *Brown v. Humble Oil and Refining Co.*, 126 Tex. 296, 83, S. W. (2d) 935 (1935), the Supreme Court of Texas reiterated the basic law of oil in place. It stated:

"The rule in Texas recognized the ownership of oil and gas in place, and gives to the lessee a determinable fee therein. \* \* \* Owing to the peculiar characteristics of oil and gas, the foregoing rule of ownership of oil and gas in place should be considered in connection with the law of capture. \* \* \* Both rules are subject to regulation under the police power of a State.

"Hence it is that the legislative power, from the peculiar nature of the right and objects upon which it is to be exerted, can be manifested for the purpose of protecting all of the collective owners, by securing a

\*The spacing rules and the proration orders in effect constitute one method of curtailment of production since a producer's total quota is dependent on the number of wells and the amount per well. Consequently, the Commission's regulations must be construed together. *Falvey v. Simms*, 92 S. W. (2d) 292.

just distribution, to arise from the enjoyment, by them of their privilege to reduce to possession, and to reach the like and by preventing waste."

\* \* \* "It (the spacing rule) guarantees the opportunity in each owner to recover his oil by providing an exception to a uniform spacing regulation that would otherwise prevent him from doing so. The exercise of the police power under this rule does not change the rule of property. It merely regulates and controls the way in which his property shall be used and enjoyed. *Each person still owns the oil and gas in place under his land, and each still has the right to possession, use, enjoyment, and ownership of the oil and gas produced through wells located on his land, regardless of its origin. The primary rule of ownership is still operative. The rule of convenience becomes secondary.*

"Conditions may arise where it would be proper, right, and just to grant exceptions to the rule so as to permit wells to be drilled on smaller tracts than prescribed therein. Also, conditions may arise where it would be proper, right, and just to permit tracts to be subdivided and such subdivisions drilled after the adoption of the rule; but in all such instances it is the duty of the commission to adjust the allowable, based upon the potential production, so as to give to the owner of such smaller tract only his just proportion of the oil and gas. By this method each person will be entitled to recover a quantity of oil and gas under his land substantially equivalent in amount to the recoverable oil and gas under his land."

Upon re-hearing in this case, the Court reiterated that it was the function of the Commission to make any necessary adjustments in its spacing and proration regulations to meet conditions as they arise. *Brown v. Humble Oil and Refining Co.*, 87 S. W. (2d) 1070.

In its proration as in its spacing orders the Railroad Commission must protect the correlative rights of all producers in the oil in place. The power to prorate has been established through a long history of court action and legislative enactment. That the Commission can curtail production by proration orders is now well established. *Champlin*

*Refining Co. v. Corp. Comm.*, 286 U. S. 210, 52 S. Ct. 559; *Amazon Petroleum Corp. v. Ryan*, 293 U. S. 388, 55 S. Ct. 241; *Marshall and Meyers*, "Legal Planning of Petroleum Production: Two Years of Proration," 42 Yale Law Journal, 701 (1933). The Texas conservation statutes lay down only a broad principle in regard to the correlative rights of common owners of a pool. The statute requires that in any order curtailing production

"the Commission shall distribute, prorate, or otherwise apportion among the various producers on a reasonable basis."

Texas Revised Civil Statutes, 1925, Art. 6049c.

However, proration "on a reasonable basis" has uniformly been interpreted as proration designed to accord each producer in a field opportunity to obtain the oil in place beneath his lease.

"It is the law that every owner or lessee of land is entitled to a fair chance to recover the oil and gas in or under his land, or their equivalent in kind."

*Gulf Land v. Atlantic Refining Co.*, 131 S. W. (2d) 73, 80. (1939).

On a recent reappraisal of the problem a lower Federal court accurately summarized the law as follows:

" . . . whenever the Legislature imposes lawful restrictions upon the quantity of oil or gas that may be produced, so that thereafter owners may not any longer, under the common law rule of capture, fully fend for themselves, the duty rests upon the Legislature to make provision for the proration and distribution of the allowed amount among the wells in the field, so that no one of those thus limited may take undue advantage of the other.

"We think the statute is simply and clearly phrased to give effect to a public policy, and to exercise the police power in respect to matters which the courts of Texas

and of the United States uniformly hold it is the right of the State by statute, to control. *This right extends to preventing one person from unduly draining from under the lands of another, oil and gas lying in a common pool equally when the undue drainage is for wasteful uses and when the rule of capture no longer applying, because of lawful statutory limitation, one of the owners, by drawing more than his due proportion of the limited share, is draining the lands of his co-owners."*

*Henderson v. Terrell*, 24 Fed. Supp. 147. Cf. *Amazon Petroleum Corp. v. Comm.*, 5 Fed. Supp. 633. *Peoples Petroleum Producers v. Smith*, 1 Fed. Supp. 361.

## II.

**The Proration Principle Advocated by the Respondent Denies Less Fortunately Situated Producers Right to Oil in Place and Adds to Respondent's Lease Migratory Oil Drained to It as "Oil in Place".**

The principle for proration advocated by the Respondent makes a plausible pretense of adhering to the doctrine of oil in place but in fact repudiates it. Under the proposed principle, on each proration date new allowables would be predicated upon the new relationship between the reserves of Respondent's lease with the total reserves for the field. Thus by progressive stages Respondent would produce an ever increasing proportion of the field's reserves. Pressure gradients to the Respondent's lease would be increased and oil would be drained from the lands on the west. More allowable to the Fairway would mean less to the western and eastern edges and a proportionately larger utilization of the reservoir energy by the Fairway producers. The depletion of these portions of the field will be accelerated. Producers in these sections of the field would receive *less than oil in place* while the Respondent and others similarly situated would gain by migratory oil from the west, obtaining *more than oil in place*.

Respondent would justify this by shifting the emphasis from the recovery of "oil in place" to the claim of an "equal" opportunity "to produce his fair share of the oil from the common reservoir" (R. 1010). The fact that this results in the acquisition of migratory oil is ascribed to "natural advantages" of the Fairway. This means nothing more than that the Respondent, fortunately located in the Fairway, demands the protection of the conservation laws to prevent operators on the west and east from utilizing to the full, if wastefully, the reservoir energy to recover the oil in place under their lands, while at the same time itself enjoying the results of the application of the Rule of Capture, contrary to *Henderson v. Terrell, supra*, p. 25.

The estimated recoverable reserves of Respondent's lease upon which the injunction granted below is bottomed specifically includes not only oil in place but the migratory oil which will be obtained as a result of producing under the formula embodied in the injunction. Mr. Buck, who made the estimate for Respondent, testified as follows (R. 308):

"Q. Now, Mr. Buck, what do you mean by the recoverable reserves under a tract?

"A. That is how much oil he will get between now and the time that the property will be abandoned;

"Q. Do you restrict that to the oil that he will recover that is directly under his tract?

"A. No, sir, that is the amount of oil that he will reduce to possession in his tank, wherever it might come from.

"Q. Well, now, do you mean in figuring on the recoverable oil from the Rowan & Nichols tract, you figure oil that will migrate to his tract from the tracts to the west?

"A. That is correct, that all had to be taken into consideration, counsel."

Respondent relies upon *Peoples Petroleum Producers v. Smith*, 1 Fed. 361. In that case the proration formula first set up by the Commission was found invalid because it pro-

rated solely on a per well basis. The Court found that such proration in operation would penalize the areas with largest productive capacity and was not a basis for "ratable taking" which would give to each producer a fair opportunity to recover the oil in place. That decision striking down an order which inequitably and *adversely* affected producers situated as is the Respondent is certainly no precedent for a formula which inequitably but *favorably* affects the Respondent. Even in that case one of the basic objections to the Commission order was that that order permitted undue drainage. In that case, Judge Hutcheson, considering the plight of producers situated as producers on the west are in this case, said,

"Whereas, if the present condition is maintained, plaintiffs will lose oil to which they are entitled to the wells on the East, and long prior to the exhaustion of the oil and gas in the reservoir, the rise in the water will saturate plaintiff's wells, drowning them out, and the sands lying to the east will produce the oil which has been driven from plaintiff's lands to them".

The proration formula adopted by the District Court below and affirmed by the Circuit Court of Appeals is thus fatally defective because it inequitably favors the Respondent and others similarly situated and does not conform to the basic property law of oil in place.

### III.

#### **The Proration Order of the Railroad Commission Is Not Unreasonable, Arbitrary and Confiscatory of the Property of the Respondent.**

The search for a valid proration order in Texas took a torturous path between Federal Court and State legislature until finally a proration order met court approval. *Marshall and Meyers*, "Legal Planning of Petroleum Production: Two Years of Proration," 42 Yale Law Journal, 701 (1933).



The present method in its fundamental essentials has been invoked since 1933. *Amazon Petroleum Corporation v. Railroad Commission*, 5 Fed. Supp. 663 (1933). Cf. *Danciger Oil and Refining Co. v. Smith*, 4 F. Supp. 236.

The present method is a fair and reasonable attempt to give each producer an "equal opportunity" to get his "fair share of the oil from the common reservoir". This does not mean that each producer must get his aliquot share of the total quantity without regard to the dynamics of oil production which directly affect the actual quantity available in the field as a whole and to any part thereof. This present proration formula is flexible, permitting a reassignment of weights to each factor as continuous study and observation of the field in operation makes it advisable. For example, as a result of further Hearings and collection of data, a subsequent Order has given greater weight to sand thickness. This Order likewise has been stricken by a statutory Court because proration was not based solely on the ratio of lease reserves to full reserves.

*Humble Oil Co. v. Railroad Commission*, Decided D. C. (W. D. of Tex.), Feb. 21, 1940, unreported as yet, Appeal pending, No. ....

*Rowan and Nichols v. Railroad Commission*, D. C. (W. D. of Tex.), unreported as yet, Appeal being perfected.

The East Texas field has served as a scientific laboratory where proration has been tested and the technique of curtailment of production has been developed. Much has yet to be learned, particularly in the ascertainment of the amount of recoverable oil in a reservoir.

**The present proration method does not presently injure Respondent.** The present proration method is geared to readily ascertained and measurable factors. It is designed to permit the equitable exploitation of the field by maintaining the relative relationship between producing properties in a dynamic process of production. Curtailment is main-

tained as a relative matter as between wells and not on any absolute basis. As long as each well has opportunity to use the common reservoir energy to recover its oil in place without undue dissipation of the energy and without improper drainage, as long as no oil is displaced and set in migration, as long as the optimum total amount of oil is produced, it is immaterial what the actual reservoir content is or what the total recovery of an area or of the field may turn out to be. Over the life of the field, each well will get its "fair share" of the total recovery whatever it may be and despite the inaccuracies of any estimates of the recoverable oil.

The Respondent has not shown that he has been deprived of a "fair share" of the oil in place thus far in the development of the field. The contrary is true; despite all it has produced Respondent has, through improper drainage, still practically as much oil under its land as when it started (*Supra*, p. 9). It asks for more oil *now* for fear it will lose some in the *future*. In order to assuage its fear, it asks for a new basis of proration based on dubious estimates of recoverable oil, which would give it a vested right in continued *drainage to its property*.

**The present method is not dependent upon highly conjectural estimates of recoverable oil.** As yet there has been developed no scientific method of determining the amount of recoverable oil in a given area with sufficient accuracy for purposes of apportionment. Great strides have been made and estimates serve many practical purposes. However, the estimates of experts vary so greatly because of the variable factors involved (R. 365, 369, 380, 387, 509-518) that the Commission has long officially taken the position that it can not accept such estimates for use in proration (R. 925). No better illustration of this can be found than in the estimates made at different times by Mr. Rowan of the Respondent for the Todd "B" lease. In various legal proceedings, Mr. Rowan has testified that the recoverable oil per acre-foot for this lease is 45,000 barrels or 70,000 barrels or

60,000 barrels (R. 906). The variation is as much as 55%. The Courts below have taken the last estimate, apparently because it is last, as the basis for the judgment in this case.

**The Respondent has shown no basis to attack the reasonableness of the Commission's Order.** The present proration method has certainly not as yet injured Respondent. In fact, primarily due to early defects, the proration system has permitted Respondent to produce in excess of 355,000 barrels of oil and, at the same time, to replenish his reservoir by draining practically that amount to his lease. No present net drainage away from the lease and no present confiscation have been shown, only alarms for the future while Respondent has gained for the day.

Injunctive relief should have been denied Respondent in this case as lower Federal Courts have done in similar cases challenging proration orders where no present irreparable injury was established. *Borrollium Oil Co. v. Smith*, 4 F. Supp. 624; *Milton v. Railroad Commission*, 10 F. Supp. 984. The refusal to grant relief without a showing of present irreparable injury to the property of Respondent is in accord with the doctrine frequently reiterated by this Court. *Premier-Pabst Sales Co. v. Grosscup*, 298 U. S. 226, 56 S. Ct. 754; *Dahke-Walker Milling Co. v. Bondurant*, 257 U. S. 282, 42 S. Ct. 106; *Commonwealth v. Mellon*, 262 U. S. 447, 43 S. Ct. 597; *Aetna Insurance Co. v. Hyde*, 275 U. S. 440, 48 S. Ct. 174; *Yazoo v. Jackson*, 226 U. S. 217, 33 S. Ct. 40; *Murphy v. California*, 225 U. S. 623, 32 S. Ct. 697. The mere fact that others may receive more than a fair share of the oil is not grounds for relief, if the Respondent is receiving his fair share. In fact, the Respondent's wells are more densely drilled than the average in the field. It can not complain if others are still more densely drilled. *Empire Gas and Fuel Co. v. Railroad Commission*, 94 S. W. (2d) 1240. Cf. *Kuchner v. Irving Trust Co.*, 299 U. S. 455, 57 S. Ct. 298.

## IV.

### The Commission's Order Does Not Deprive the Respondent of Its Oil in Place.

It is conceded, even by the expert witness for the Respondent, that at the present time there is substantially as much oil beneath the Todd "B" lease as there was initially (R. 621). Nevertheless, the Respondent claims that the Commission's order will operate to deprive it of its oil in place.\* The Respondent introduced calculations to prove it, comparing estimates of "recoverable oil" beneath its tract and estimates of the total recoverable oil in the East Texas field and the current rates of production. The reliability of the estimates of the recoverable oil beneath the Todd "B" lease has already been commented upon. The bald estimates as to the total recoverable reserves of the field is equally suspect. The Record does not disclose the basis for the figure used.

The Respondent introduced an Exhibit using these "estimates" and calculating the time it would take to exhaust the field's "estimate" at the present fixed field allowable and the time it would take to exhaust its lease's "estimate" at the *present fixed* lease allowable. (Exhibit No. 2, offered R. 120, copied R. 675). The Courts below adopted this method of calculation although they did not adopt the same figures. The District Court found (R. 72) that at the present

\* How the Respondent is presently injured is most obscure. Evidence was introduced to the effect that the per acre recovery originally was 60,000 barrels of the oil originally in place while at the time of trial it was about 46,000 barrels due to production but that the production from the lease was not proportionate to the production for the field as a whole (R. 107). In other words, of the original oil in place not as much was withdrawn as should have been. Meanwhile, the oil taken has been substantially replaced (R. 311, 621). Respondent claims as "recoverable oil" oil it can produce "wherever it might come from" (R. 308). Apparently, the loss lay in the fact that the lease's rate of production was not rapid enough to have drawn still more oil from beneath someone else's property.

rate of production, the field would be depleted in 11 years while it would take the Respondent 28 years to produce the estimated amount of "recoverable oil" "wherever it might come from" (R. 308). The Circuit Court of Appeals adopted the figures showing that the field would be depleted in 16 or 17 years in which time the Respondent "would be permitted to produce only approximately one-half of the oil it owned" (R. 1009).

Both Courts made the fundamental error of taking the Exhibit without the gloss. Upon cross-examination, Mr. Buck who prepared the Exhibit confessed to its error. It assumes, contrary to the fact (R. 527), that the allowable for this lease in the Fairway will remain static rather than increase as wells on the edges become depleted first. Brief excerpts from the Record demonstrate beyond peradventure the fallacy in these calculations:

From Cross-Examination of Mr. Buck:

"Q. Of course, Mr. Buck, as the water levels rose, the wells here along the western edge of the field would go out of production wouldn't they?

"A. Yes.

"Q. And also it would follow, would it not, Mr. Buck, that if instead of keeping the same allowable for the well you kept the same total allowable for the field, as the wells on the west were forced to close down by reason of encroachment of the water, there would be a greater allowable for the remainder of the wells.

"A. Yes, sir.

"Q. As these wells on the west went out the Rowan & Nichols allowable would be increased all the time, wouldn't it?

"A. That is right.

"Q. In calculating the number of years Rowan & Nichols would take to get their oil you assumed the same daily allowable from there on, didn't you?

"A. Yes, sir.

"Q. That wouldn't be true, Rowan & Nichols would get a higher allowable as the wells on the west side went on?

"A. Some higher allowable, that is true.

"Q. So it wouldn't take as long to get their production out as it shows in this schedule to produce their oil?

"A. Perhaps not.

"Q. That is correct, is it not?

"A. That is correct." (R. 302).

It is submitted that the Courts below were clearly in error in holding that the present method of proration would cause any deprivation of Respondent's oil during the productive life of the field and leases. On the contrary, because of its location, the Respondent's wells will be among the longest lived wells and they will receive progressively increased allowables as the rest of the field goes out of production. They will benefit by any drainage and migration of oil. They stand best of all to produce at least the equivalent of the oil originally in place. (R. 393, 456, 514, 527, 571). Certainly the contrary of any loss by depletion has been true thus far (R. 621).

## V.

### **The Delay in Production of Respondent's Lease Due to the Tempo of the Proration Schedule Is Not Confiscatory.**

The Commission freely concedes that the current rate of production for Respondent's wells, if maintained indefinitely, would not provide the Respondent with its fair share of oil. However, over a period of time the progressive increase in allowable for its wells will equalize matters between the correlative producers and give to each his aliquot share for the period. This, it is suggested, constitutes present day confiscation and compels the Respondent to gamble on the future markets for its oil (R. 72). In this connection, the Respondent compares the present allowables permitted to some of its wells capable of producing over



20,000 barrels a day (R. 99) with that for wells which barely make 20 barrels per day (R. 118, 677) and claims the curtailment as to its property is not necessary to prevent waste (R. 550) and is denial of due process.

The phrase "20,000 barrels a day" is highly deceptive. This potential capacity is determined by a test in which a well is allowed to run at capacity for an hour with surrounding wells shut in so as to give the test well the full benefit of the pressure in the area (R. 427). The result is only an index number for relative "potentials". If the field were produced at open flow, the potentials for all flush wells would rapidly decline through the great dissipation of energy. 20,000-barrel wells thus would not produce at that rate except for a very short period.

In the light of what Respondent concedes, the charge of confiscation is specious. It concedes its wells may in the interest of conservation be curtailed from over 20,000 barrels a day to about 44 barrels a day without constituting "present day confiscation". The curtailment from about 20,000 barrels a day to a little over 22 barrels a day (with progressive increase over the life of the field) in the interest of equitable conservation can hardly have any more dire confiscatory consequences nor cause a much more noticeable gamble on the future.

The demand to produce more because one can produce one's oil "without waste" without regard to the effect on the conservation plan for the whole field or the correlative rights of producers in a common pool has been raised from the earliest days of conservation legislation. From the first, it has been well established that such curtailment in the interest of a broad conservation policy and on behalf of the correlative rights of all producers is valid.

*Champlin Refining Co. v. Corporation Commission*, 286 U. S. 210, 52 S. Ct. 559.

The protest over delay in production is thus without merit. The objection to greater production per acre in some

areas as compared with that of Respondent is considered hereinafter.

## VI.

### **A Disproportionate Present Allowable to Wells on Small Tracts per se Is Not Ground for Invalidating the Proration Order.**

Because many of the wells drilled on small tracts are located in the thin sand area (R. 677), it has been too easy to confuse any inequity of granting a full equal allowable to a well on a small tract as compared to an offset on a full sized tract with the justifiable difference in tempo of production as between different locations in the field. It can not be gainsaid that a producer may have a legitimate complaint under certain conditions in a situation where equal allowables are given to off-setting wells on leases greatly differing in size. The law recognizes the possibility of inequity in such cases. *But the answer does not lie in the invalidation of the proration orders for the field as a whole.*

In this connection, the District Court stated that "The difficulty in which the Commission finds itself grows largely out of its relaxation of its own spacing rules" (R. 73). Irritation directed at the Commission, whether justified or not, in this case results in a decision adversely affecting not the Commission but the producers having correlative rights in the field.

The admittedly more rapid production depletion of the tracts on the edges under the method of proration embodied in the Commission's order is not confiscatory of Respondent's property. True, the sands are thinner (R. 288, 394) and the density of wells is great (R. 677) and the pressure on the west is high (R. 355). But the life of wells located on these tracts is comparatively short (R. 397); they must produce the equivalent of their oil in place at a more rapid tempo than do wells in the Fairway or face death themselves, and witness the migration of oil in place to the long lived wells of the Fairway (R. 571).

**The threat of drainage from Respondent's lease is not a current problem.** Despite the obvious drainage to the Respondent's lease, Respondent charges the operation of the Commission's order will cause drainage from its lease eastward to still other leases in the Fairway: It will be remembered that the East Texas reservoir is triangular in shape with the lower eastern side formed by impervious rock and the lower western side by the slowly (as a result of proration) rising water table. The Respondent's lease is west of the juncture of these two sides and is underlaid by water. It is its contention that the wells to the east on the "dry side" are even longer lived than its wells and that as the water table rises it will eventually drown out its wells while forcing a migration of its oil eastward (R. 606).

However, the field has not yet reached the stage where the drainage has progressed to the point where Respondent is losing any oil in place or its equivalent (*Supra*, p. 9). Meanwhile, other areas are being given opportunity by the staggered production allowables to obtain the oil in place or its equivalent within their areas. After the western thin sands have been drowned out and the tight eastern sands have been depleted, production will be confined to the thick sands of the Fairway. It may well be at some future time that the balance of in-drainage and out-drainage will shift so that Respondent's wells will stand to lose the equivalent of its oil in place.

At such a time, Respondent would have a legitimate claim. It is one of the virtues of the present proration method that it is flexible and that varying weights can be given different factors in the proration formula as the current facts require. The Respondent would have its administrative remedy of obtaining a change in the proration formula to do equity under the then developed conditions upon a proper showing at an administrative hearing.

Certainly, potential future drainage from Respondent's lease does not justify it in claiming actual present drainage

to its lease to the deprivation of others of their oil in place or its equivalent.

**The wells drilled on small tracts under Rule 37 exceptions are legal producers entitled to oil in place or its equivalent.** The Respondent has conceded that all the wells drilled under the spacing regulations are legal (R. 4) and entitled to the oil in place or its equivalent. The Respondent itself was well in the van of the race for permits to drill wells on exceptions to the general spacing rule (*Supra*, p. 9). Where such wells have been drilled, they have been drilled under a permit issued by the Commission after hearing and a finding that such a well is necessary in order to prevent waste or to prevent the confiscation of property (R. 896). Or they have been drilled under court injunction upon a reversal or a denial of a permit by the Commission. Cf. *Gulf Land Co. v. Atlantic Refining Company*, 131 S. W. (2d) 73.

Likewise, if any permit for an exception is improvidently given by the Commission any person who has been adversely affected can have a court appeal to set aside such a permit. Texas Revised Civil Statutes, as Amended, 1935, Article 6049c.

Being more densely drilled than the average of the field (*Supra*, p. 9), the Respondent can not complain merely because others are still more densely drilled unless the densely drilled tracts are close enough so as to cause adverse drainage as between the respective leases (*Supra*, p. 9). *Boxrollium Oil Co. v. Smith*, 4 F. Supp. 624; *Milton v. Railroad Commission*, 10 F. Supp. 984.

**The case of the "Wood" well.** The Record discloses only one well close enough to the Respondent's lease to threaten drainage, that belonging to R. M. Wood. R. M. Wood has a one-acre tract surrounded by the larger tracts of the Respondent and other producers. From the discovery of the field until August, 1937, it was unproduced, the oil beneath it being drained to the wells in the sur-

rounding tracts (R. 114). Finally a permit to drill a well was granted to Wood on December 23, 1936, after due hearing (R. 955). Opposition was raised thereto and a rehearing was granted but the grant of the permit was affirmed (R. 957). The Respondent and another offsetting producer took an appeal to the District Court of Travis County, Texas. It was found that the permit was granted "to prevent confiscation of property". The complainants lost their case and the judgment of the District Court was affirmed in the Court of Civil Appeals. *Shell Petroleum Corporation v. Railroad Commission*, 120 S. W. (2d) 526. Application for writ of error was dismissed by the Texas Supreme Court.

The Wood well has been producing for about three years. Basing calculations on the figures of the Respondent (R. 675), this well with the allowable now granted to it would take some ten years to produce the equivalent of the oil in place. Meanwhile, some of the Respondent's wells have been producing for nine years and during the earlier years were draining the Wood lease (R. 569). The Wood well is now recovering the equivalent of the oil in place to restore it to its original relative position with the Respondent's wells. Meanwhile, it should be remembered that the Respondent-Wood area has gained by drainage; thus far, at least, there has been no net drainage from the Respondent due to the Wood well.

However the Respondent does not have to stand by and permit undue drainage to the Wood well. Rule 37 envisages the necessity, when the facts of a specific case require, of granting an exception permit to off-set a well drilled on an exception. In the proceeding of this case before the Commission, the Respondent established that the facts justify consideration to it. Thereupon, the Commission specifically granted a permit to drill a sixth well on the Todd "B" lease to off-set the drainage attributable to the Wood well (R. 38).



The Respondent protests that its present wells are sufficient to produce all of the oil in place or its equivalent beneath its lease without waste and that it should not be subjected to the costs of an additional well to give it its fair share of oil and to protect it against the Wood well. However, the Respondent is not required to drill the sixth well. Over a slightly longer period of time, it will recover the oil in place or its equivalent with only five wells. Meanwhile, as long as it gets its full share, it can not complain if the Wood well seems to be receiving proportionately more. See the *Boxrollium case*, *Supra*, p. 37. However, at some future time should the facts then disclose that the operation of the Wood well will cause an actual net drainage loss to Respondent, it has its administrative recourse to the Commission for an adjustment in allowables. Its present action is premature. *Magnolia Petroleum Co. v. Blankenship*, 85 F. (2d) 553; *Cf. Brown v. Humble Oil Co.*, 126 Texas 296, 83 S. W. (2d) 935.

**The minimum allowable per well is not inherently unreasonable or arbitrary.** The Respondent has conceded that in a proration formula a minimum allowable is essential. (*Supra*, p. 13). Objection was made that the twenty-barrel minimum allowable was too high. The Courts below were highly critical of the allowable. Moreover, under the proration formula they approved no minimum allowable was allotted. The fact that this formula in operation would result in a total allowable to some wells as low as five or six barrels was not found unreasonable. This was found to be so on the theory that the financial income would be enough so as not to be confiscatory. Consideration of drainage from the lease because of too small a minimum was given little consideration.

However, when the formula thus adopted is found invalid, the question of the reasonableness of the twenty-barrel allowable again must be considered. The burden of proving the reasonableness of the weight given to this



factor is not upon the Commission. The order is presumptively valid unless positively shown to be arbitrary. *Thompson v. Consolidated Gas Utilities Co.*, 300 U. S. 55, 69, 57 S. Ct. 364; *Henderson Co. v. Thompson*, 300 U. S. 258, 264, 57 S. Ct. 447; *Champlin Refining Co. v. Corporation Commission*, 286 U. S. 210, 234, 52 S. Ct. 559; *Knoxville v. Knoxville Water Co.*, 212 U. S. 1, 7, 29 S. Ct. 148.

Commission experts testified at length on the reasonableness of the minimum set by the Commission (R. 522, 411, 421). The Record discloses that experts for the Respondents likewise recommended minimum figures, some closely approximating that set by the Commission. One expert for the Respondent, conceding the necessity for a minimum (R. 328), testified that a minimum of between 15 and 17½ barrels per day should be allowed (R. 304). Another suggested but "wouldn't say arbitrarily" that ten barrels is sufficient (R. 638). A third recommended 5 barrels as an "arbitrary figure" (R. 155), apparently solely on the ground that a well could pay out financially over a period of time with this allowable. The first expert noted above testified that such an allowable would cause many flowing wells to go on the pump in about two weeks (R. 276).

The Commission, in its discretion and for conservation reasons more than financial, determined upon twenty barrels a day for its formula. There is no showing that on the Record before it at its administrative hearing that this action constituted an abuse of discretion. The judgment of the lower Courts is not to be substituted for that of the Commission if the action of the Commission is not unreasonable in the light of the evidence before it. Nothing has been shown in this case to overcome the presumption that the Commission's order is valid. *Rochester Tel. Corp. v. U. S.*, 307 U. S. 125; *Mississippi Valley Barge Line Co. v. U. S.*, 292 U. S. 286; *Swayne and Hoyt, Ltd. v. U. S.*, 300 U. S. 297, 303.

**CONCLUSION.**

The decisions of the lower Courts create a method of proration which would deprive some producers of oil in place and give to others, such as the Respondent, a vested right in drainage contrary to the settled property law of Texas of oil in place. The lower Courts set aside a proration order of the Railroad Commission properly within its administrative powers and which were not demonstrated to be unreasonable, arbitrary, or confiscatory as to Respondent. For the reasons stated, it is respectfully submitted that the judgment of the Circuit Court of Appeals for the fifth circuit, affirming the judgment of the District Court for the Western District of Texas, should be reversed.

Respectfully submitted,

NORMAN L. MEYERS,  
*Amicus curiae.*

7. 2-4-6

# SUPREME COURT OF THE UNITED STATES.

No. 681.—OCTOBER TERM, 1939.

Railroad Commission of Texas et al., Petitioners, vs. Rowan & Nichols Oil Co.	}	On Writ of Certiorari to the Circuit Court of Ap- peals for the Fifth Cir- cuit.
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[June 3, 1940.]

Mr. Justice FRANKFURTER delivered the opinion of the Court.

The question before us is the validity, when challenged by appeal to the Fourteenth Amendment, of an oil proration order promulgated by the Railroad Commission of Texas, insofar as it applies to the respondent's wells.

To safeguard its oil resources Texas has devised a regulatory scheme for their production, and has placed its administration in the Railroad Commission's hands. Revised Civil Statutes, Arts. 6014 *et seq.* In conformity with this statute, which has familiar procedural provisions, the Commission in the fall of 1938 issued the assailed proration order covering the East Texas oil field, where respondent's wells are located. By this order each well was allowed to produce 2.32% of its "hourly potential"—that is, 2.32% of its hourly productive capacity under unrestricted flow. But the practical operation of this order was largely cut across by allowances made to "marginal wells". These are wells which, if their low productive capacity were legally curtailed, would have to be prematurely abandoned. Therefore the Texas statute gives them a special status. In accord with its policy toward these marginal wells, the Commission freed them from the burden of its hourly potential formula by allowing them production up to twenty barrels a day. Because of the large number of these low capacity units in the East Texas field, approximately 385,000 barrels out of a total daily "allowable" of 522,000 barrels were exempt from the restricting formula, leaving only about 136,000 for the class within which respondent's wells fell. Application to them of the hourly potential formula resulted in an allotment of only about twenty-two

2 *Railroad Comm. of Texas et al. v. Rowan & Nichols Oil Co.*

barrels a day to each well. Claiming that such a mode of regulation disregarded its right to the oil in place beneath its leases, respondent sought and obtained a decree from the District Court for the ~~East~~<sup>st</sup> District of Texas enjoining the Commission from carrying its proration plan into effect. 28 F. Supp. <sup>134</sup>~~133~~. With modification not here relevant the Circuit Court of Appeals affirmed the decree. 107 F. (2d) 70. We brought the case here by certiorari, 309 U. S. —, because of the importance of the matter in the administration of the Texas law and kindred conservation statutes.

As sustained by the findings of the District Court and accepted by the Circuit Court of Appeals, respondent's claims may be summarized by what follows. The Commission's proration formula as applied permits other leaseholders, more leniently treated, to capture oil at a more rapid rate than is possible for the respondent, thereby draining away oil which underlies respondent's leased lands. This is due both to the allocating formula itself, and more especially to the permission granted marginal wells to produce without limit up to twenty barrels a day. The "potential" method of allocation fails to give sufficient weight to relevant factors in the measurement of oil in place, especially to the depth of respondent's reserves situated in the "Fairway", a deep and rich portion of the East Texas field. Only an allocation based upon acre-feet of sand or its equivalent would be a reasonable means of measuring the oil in place beneath respondent's leases; and any formula failing to do this takes respondent's property without due process of law. Moreover, the allowance made to marginal wells absorbs so much of the total "allowable" as to make the Commission's order in effect an allocation on a flat per well basis, regardless of great variation in the capacity of the wells and the density with which different leases have been drilled. An important factor in producing this result is the permission frequently granted by the Commission, under power conferred upon it by statute, for departure from its spacing and drilling rules whereby the field has been drilled with an irregular density. As a consequence, the more densely drilled tracts adjoining respondent's leases may, by virtue of their marginal allowances, produce oil in such quantities as to drain away respondent's reserves. Such is the basis for respondent's resistance to the order.

Underlying these claims is as thorny a problem as has challenged the ingenuity and wisdom of legislatures. In major part it was created by the discovery of vast oil resources and by their development under rules of law fashioned in the first instance by courts on the basis of analogies drawn from other fields of the common law. In Texas, according to conventional doctrine, the holder of an oil lease "owns" the oil in place beneath the surface. *LeMar v. Garner*, 121 Tex. 502; *Stephens County v. Mid-Kansas Oil & Gas Co.*, 113 Tex. 160; 1 Summers, *Oil and Gas* (2nd ed.), p. 16. But equally recognized is the "rule of capture" which subjects the lessee's interest to his neighbors' power to drain his oil away. Therefore, to speak of ownership in its relation to oil, is to imply a contingency of control not applicable to ordinary interests in realty. See Ely, *The Conservation of Oil*, 51 Harv. L. Rev. 1209, 1218-22. Each leaseholder, that is to say, is at the mercy of all those who adjoin him, since oil is a fugacious mineral, the movements of which are not confined by the artificial boundaries of surface tracts. This gap between the geological nature of the oil pool and the formal surface rights of the lessees is frequently bridged by the drilling of "offset wells" at the boundary of each surface tract, so that owners may protect themselves against the exercise of one another's capture rights. Partly to mitigate the undesirable consequences of this unsystematized development, the oil-producing states, Texas among them, have enacted conservation laws with appropriate administrative mechanisms to control drilling and production. The general scheme of the Texas statute is not challenged. Its constitutionality is here settled. *Champlin Ref. Co. v. Commission*, 286 U. S. 210.

But merely writing laws is only the beginning of the matter. The administration of these laws is full of perplexities. State agencies have encountered innumerable difficulties in trying to adjust the many conflicting interests which grow out of the rule of capture and its implications. The experience of Texas illustrates that a brood of litigation almost inevitably follows the inherent empiricism of these attempted solutions. See Ely, *op. cit. supra*, at pp. 1225-29; Marshall and Meyers, *The Legal Planning of Petroleum Production: Two Years of Proration*, 42 Yale L. J. 701. For some years the Texas Commission has been engaged in experimental endeavor to

devise appropriate formulas for a fair allotment of the allowable production. The commitment of such a delicate task to the administrative process has not escaped challenge in the courts, and at times the challenge has been successful. Compare *MacMillan v. Railroad Commission*, 51 F. (2d) 400; *Constantin v. Smith*, 57 F. (2d) 227; *Peoples' Petroleum Producers v. Smith*, 1 F. Supp. 361; *Amazon Petroleum Corp. v. Railroad Commission*, 5 F. Supp. 633. But such cases are only episodes in the evolution of adjustment among private interests and in the reconciliation of all these private interests with the underlying public interest in such a vital source of energy for our day as oil. Certainly so far as the federal courts are concerned the evolution of these formulas belongs to the Commission and not to the judiciary. ~~Except where the jurisdiction rests, as it does not here, on diversity of citizenship, the only question open to a federal tribunal is whether the state action complained of has transgressed whatever restrictions the vague contours of the Due Process Clause may place upon the exercise of the state's regulatory power.~~ A controversy like this always calls for fresh reminder that courts must not substitute their notions of expediency and fairness for those which have guided the agencies to whom the formulation and execution of policy have been entrusted.

General as these considerations may be, they are decisive of the present case. Both the District Court and the Circuit Court of Appeals appear to have been dominated by their own conception of the fairness and reasonableness of the challenged order. For all we know, the judgment of these two lower courts may have been wiser than that of the Commission, and their standard of fairness a better one. But whether a system of proration based upon hourly potential is as fair as one based upon estimated recoverable reserves or some other factor or combination of factors, is in itself a question for administrative and not judicial judgment. According to the Commission's experts, theories of allocation urged by the respondent and accepted by the courts below would in fact give to respondent more than its fair share of the oil in the field. Respondent, the Commission's witnesses contend, would gain undue benefit from the constant eastward migrations of oil caused by the gradual influence of subsurface pressure gradients—and this at the expense of other lessees in geologically less fortunate portions of the field. The Commission's experts further insisted that, though much technical pro-



gress has been made, estimates of recoverable reserves beneath the surface of a particular tract remain largely an indeterminate venture; and that hourly potential actually takes into account, at least in some measure, all relevant factors for ascertaining recoverable reserves. Certainly in a domain of knowledge still shifting and growing, and in a field where judgment is therefore necessarily beset by the necessity of inferences bordering on conjecture even for those learned in the art, it would be presumptuous for courts, on the basis of conflicting expert testimony, to deem the view of the administrative tribunal, acting under legislative authority, offensive to the Fourteenth Amendment. Compare *S. C. Hwy. Dept. v. Barnwell Bros.*, 303 U. S. 177, 191, *et seq.*

Equally enmeshed in a conflict of *expertise* is the claim most vigorously urged by respondent that, taken in connection with exceptions made by the Commission to its spacing rules and with the unrestricted twenty barrel allowance to marginal wells, the proration order substantially places production on a flat per well basis. Such a result, according to respondent's claim as accepted by the lower courts, gives a constitutionally inadmissible advantage to smaller and more densely drilled tracts as against those owned by respondent. But this claim really presents a more specialized aspect of the general problem. In regulating flow of production the treatment to be accorded to small and irregularly shaped tracts which do not fit neatly into the Commission's general scheme for spacing, has presented a difficulty almost as great as the framing of proration formulas. Compare Walker, *The Problem of the Small Tract under Spacing Regulations*, 17 Tex L. Rev. 157 (Supp. Bar Association Proceedings). To deny the holders of these tracts permission to drill might subject them to the risk of losing their oil in place or of being put at the mercy of adjoining holders. In many instances, therefore, the Commission has granted exceptions to its general spacing rule on the basis of which investments have been made and wells drilled. If these wells, most of them small, were restricted to production on the basis of an hourly potential formula, it might be unprofitable to operate them at all. Not only are the individual interests of these small operators involved, but their effect on the state's economy is an appropriate factor to be taken into account when plans are devised to keep the wells open.

A flat per well allowance to these producers was not an unnatural answer to the problem. Whether, as contended by the respondent, the maximum figure set by the Commission is too high in that it leads to the capture of oil from beneath its leases by neighboring operators, and whether a lower limit might suffice to assure profitable production—these questions take us into that debatable territory which it is not the province of federal courts to enter. The record is redolent with familiar dogmatic assertions by experts equally confident of contradictory contentions. These touch matters of geography and geology and physics and engineering. No less is there conflict in the evidence as to the solidity of respondent's apprehension that there will be drainage of the oil beneath its surface by neighboring wells. The Commission's experts insist that the threat, if existent at all, is speculative, and that the Commission's power of continuous oversight is readily available for relief if real danger should arise in the future.

Plainly these are not issues for our arbitrament. The state was confronted with its general problem of proration and with the special relation to it of the small tracts in the particular configuration of the East Texas field.<sup>1</sup> It has chosen to meet these problems through the day-to-day exertions of a body specially entrusted with the task because presumably competent to deal with it. In striking the balances that have to be struck with the complicated and subtle factors that must enter into such judgments, the Commission has observed established procedure. If the history of proration is any guide, the present order is but one more item in a continuous series of adjustments. It is not for the federal courts to supplant the Commission's judgment even in the face of convincing proof that a different result would have been better.

\* 1 "While the presence of a federal question may also open up state issues, *Siler v. Louisville & N. R. R.*, 213 U. S. 175, the claim here founded on Texas law is derived from a statute requiring proration on a 'reasonable basis.' Vernon's Texas Annotated Civil Statutes (1925), art. 6049c, § 7. The Texas decisions, insofar as they have been brought to our attention, do not make clear whether the local courts may exercise an independent judgment on what is 'reasonable.' Compare *Brown v. Humble Oil & Refining Co.*, 126 Tex. 296, 316. But, in any event, as we read the Texas cases, the standard of 'reasonable basis' under the statute opens up the same range of inquiry as the respondent in effect asserted to exist in his claims under the Due Process Clause. These latter claims we have found untenable. What ought not to be done by the federal courts, when the Due Process Clause is invoked ought not to be attempted by these courts under the guise of enforcing a state statute. Whether the respondent may still have a remedy in the state courts is for the

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vs.  
Rowan & Nichols Oil Co.

[June 3, 1940.]

Mr. Justice ROBERTS.

The petitioners' proration order is challenged not merely as unfair or unreasonable but as confiscatory of the respondent's property. Upon the allegations of the bill, the District Court had jurisdiction. Although the problem of proration presented technical and difficult questions, and although the Commission was vested with a broad discretion in dealing with them, these facts could not justify the court's abdication of its jurisdiction to test the Commission's order. The case was tried *de novo* and neither the full record made before the Commission nor its findings appear in the evidence, except for what is contained in the Commission's orders. After a painstaking trial, and upon detailed and well supported findings of fact, the court reached the conclusion that the order worked a confiscation of respondent's property.<sup>1</sup> The court said: "The respondents' [petitioners'] engineers frankly admitted that the present scheme of proration is nothing more or less than one on a per well basis." Referring to such a basis, the court added: "It is sufficient to say that it takes no account of the difference in the wells, of the richness or thickness of the sand, of the location upon the structure, of the porosity or permeability of the sand, of the estimated oil reserves, or of the acreage upon which the respective wells are situated. The worst property is raised to the level of the best and the best is lowered to the level of the worst." The court concluded that the order operated to appropriate, for the benefit of others, the respondent's oil without compensation.

<sup>1</sup>28 F. Supp. 131.

Texas courts to determine, and is not foreclosed by the denial, on the grounds we have indicated, of the extraordinary relief of an injunction in the federal courts."

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The Circuit Court of Appeals approved and adopted the findings and conclusions of the District Court.<sup>2</sup>

The opinion of this court, in my judgment, announces principles with respect to the review of administrative action challenged under the due process clause directly contrary to those which have been established. A recent exposition of the applicable principles is found in the opinion of Mr. Justice Brandeis, written for a unanimous court, in *Thompson v. Consolidated Gas Utilities Corporation*, 300 U. S. 55, dealing with a proration order affecting gas, entered by the same commission which entered the order here in issue. I think that adherence to the principles there stated requires the affirmance of the decree.

The CHIEF Justice and Mr. Justice McREYNOLDS join in this opinion.

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<sup>2</sup> 107 F. (2d) 70.

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